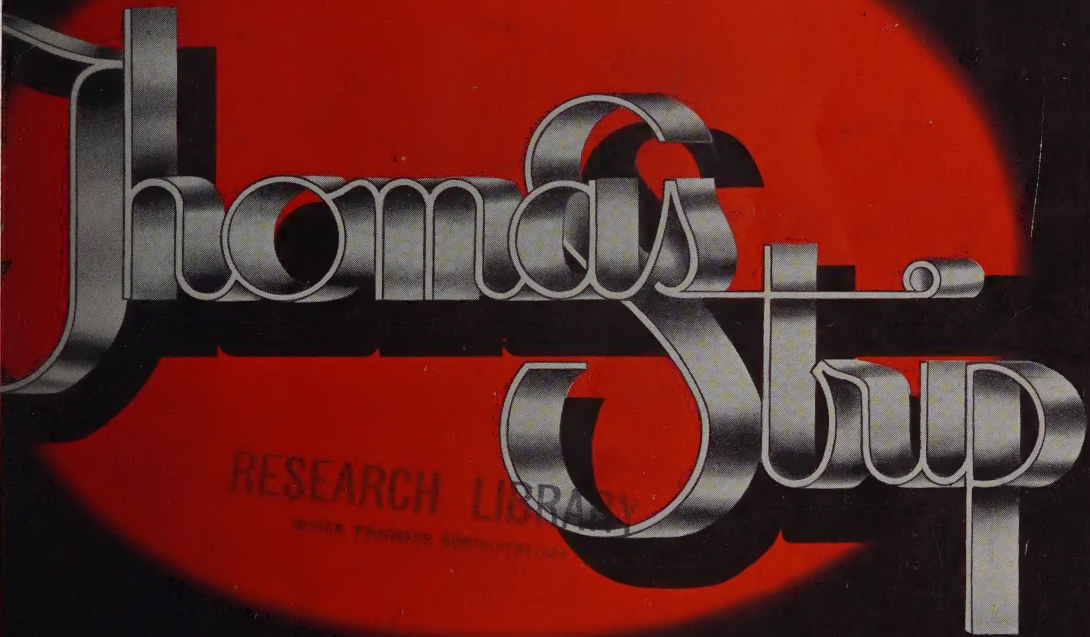


May 8, 1939

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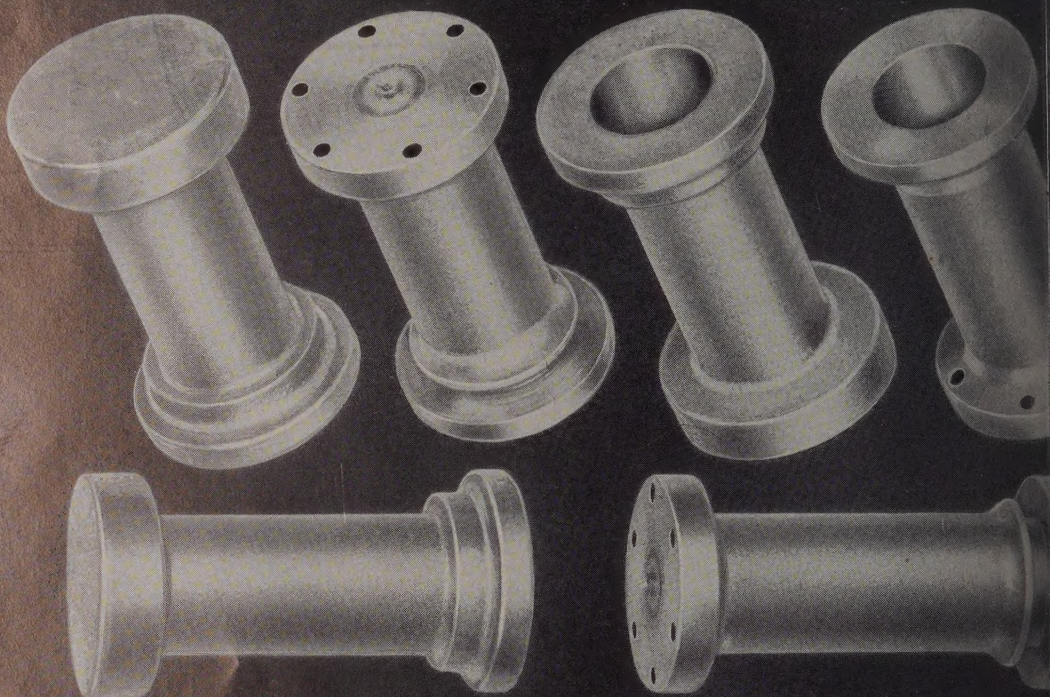
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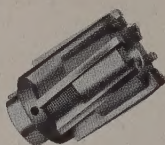
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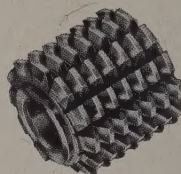




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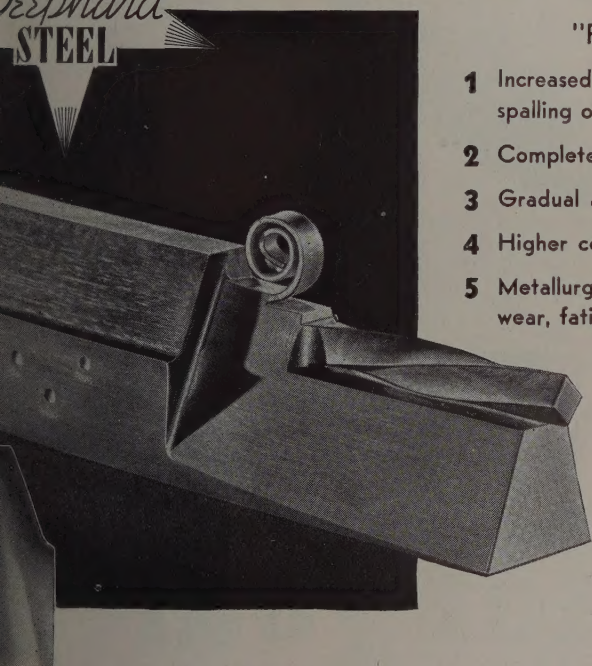
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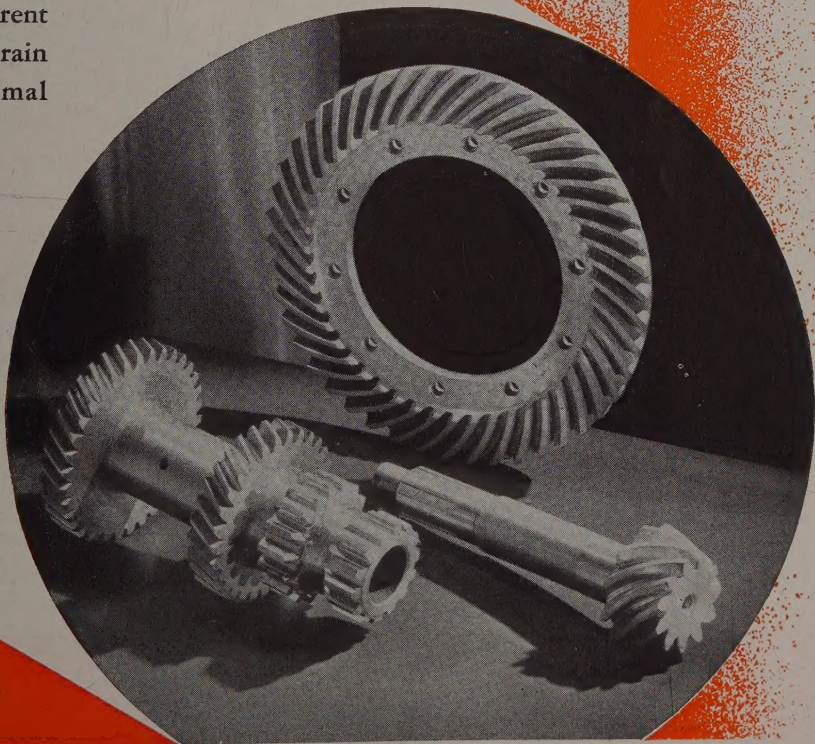
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# LEADER



# Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

## 'Kill Incentive'

For:  
would be a good idea  
complete Mr. Weir's  
diverged at the Weirton  
Commerce banquet re-  
stracted in STEEL, April  
as I feel there has been,  
ast ten years, so much  
against individualism  
ility of one man to earn  
the average.

do not want to kill this  
America. To my mind  
ly type of freedom that  
America so great. Even  
times we have had ex-  
ere certain men abused  
r, still we do not want  
opportunities that have  
n held out to every citi-  
merica, that by his own  
hard work he can accu-  
d build up industry, as  
ad Weir have done in the  
years.

my mind, is the worst  
the new deal theory, the  
all earning power in the  
lasses, regardless of the  
ability. Naturally this  
ntage to some man like  
s, when he takes by way  
ck-off and does not have  
for any of the money  
way of dues by miners,  
always claims are under-

stounded at times how  
theory is being taught in  
s. It is exactly the oppo-  
t which was taught prior  
time, and the young peo-  
country seem to be im-  
idea that not only the  
t but those that have

more, due to hard work, owe them  
a living. So many of the novels  
written in the last few years, from  
the one that attacked Washington's  
character, about twelve years ago,  
down to today, seem to be written  
from this point of view.

God knows I never had anything  
handed to me on a silver spoon ex-  
cept a good strong body that was  
able to work, but I find certain ele-  
ments are jealous of even what lit-  
tle I have accomplished or accumu-  
lated.

I think the business journals  
should do everything in their power  
to clear up in the public mind  
some of this false propaganda that  
is being preached in our colleges  
and by the new deal type politician.

WILLIAM M. BAILEY

William M. Bailey, Co.  
Pittsburgh

## More Pure Iron Powder Data

To the Editor:

The article on "Pure Iron Pow-  
der" by A. H. Allen, published in  
STEEL, April 10, 1939, pages 43 to 54,  
inclusive, is very interesting and  
contains much information not  
readily available.

I was surprised that no mention  
was made concerning investigations  
conducted by the bureau of mines,  
department of the interior, during  
the past 20 years relating to low  
temperature reduction of iron oxides  
and the development of sponge iron  
processes.

Bulletin 270, "The Production of  
Sponge Iron," by C. E. Williams,  
E. P. Barrett and B. M. Larsen, 1927,  
contains reviews of numerous sponge

iron processes, and fundamental  
chemical and mechanical informa-  
tion that would aid in the design  
and operation of a 2-diameter ro-  
tary kiln-type furnace for producing  
sponge iron.

Bulletin 296, "Iron Oxide Reduc-  
tion Equilibria," by Oliver C. Ras-  
ton, 1929, presents the properties  
of the common oxides of iron, their  
combinations with each other and  
a critical discussion of existing  
data.

Bulletin 396, "Sponge-Iron Experi-  
ments at Mococo," by Chas. G.  
Maier, 1937, describes the develop-  
ment of a rotary kiln process for  
utilizing converted natural gas as  
the reducing agent, the operation  
of a 1-ton per day pilot plant, and  
the production of about 15 tons of  
steel from sponge iron melted in an  
open-hearth furnace.

In contrast to the low percentage  
deoxidation of iron oxides treated  
in rotary kilns reported in STEEL,  
pages 45 and 46, my experience  
with a 2-diameter internally-fired  
rotary kiln showed that more than  
95 per cent of the oxygen was re-  
moved from the iron oxides during  
the production of about 1000 tons  
of sponge iron.

The results of a number of bureau  
of mines' investigations relating to  
the factors governing reducibility  
of iron ores have been published  
in the technical press.

We shall be pleased to aid you in  
obtaining any of these data you  
may desire.

E. P. BARRETT

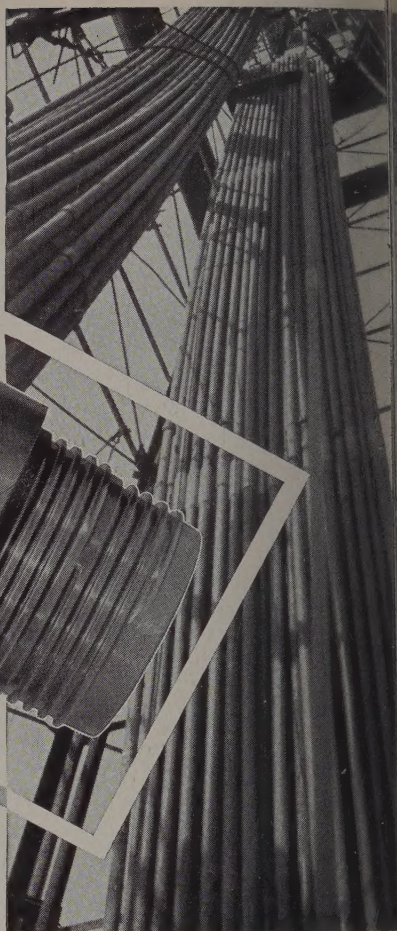
Metallurgist,  
Blast Furnace Studies Section,  
Metallurgical Division,  
Bureau of Mines,  
Washington



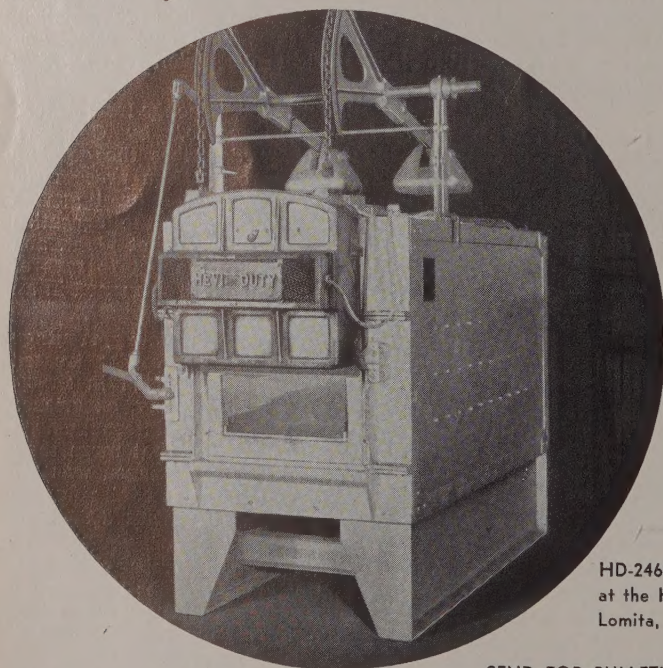
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# STEEL

ESTABLISHED 1882

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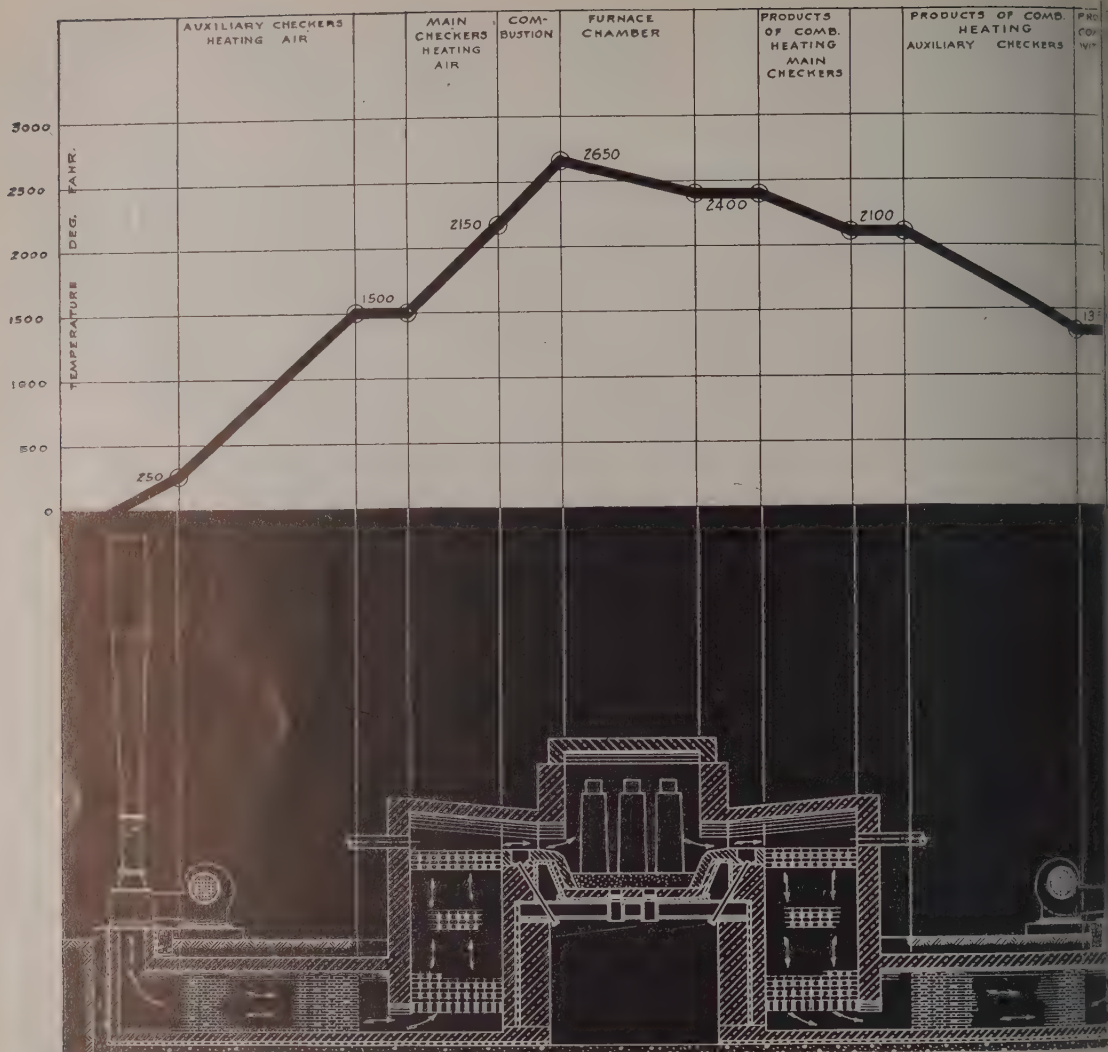
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DUCTION • PROCESSING • DISTRIBUTION • USE





## Follow the Line to Faster Re-Heating with Blast Furnace Gas

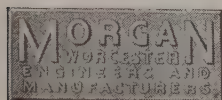
The line in the chart above indicates the steady rise in temperature as air approaches the re-heating furnace chamber. The efficiency of blast furnace gas is increased as the temperature of the air is raised.

Full advantage of this fact is taken in the construction of the Isley Regenerative Furnace Control Systems. Gases leaving one side of the furnace pass through checkers, storing a large portion of the heat, which is picked up as the air returns.

This draft is produced by air injectors in short venturi tubes. Reversing damper valves the tubes are operated manually, or automatically, according to time cycles or temperature recordings. Complete instrumentation is provided for flexible and accurate control of combustion.

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## ISLEY Furnace Control System



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English Representative: INTERNATIONAL CONSTRUCTION CO.  
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# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

## The Editor vs the News

declining five successive weeks, the steel rate last week was arrested. Ingot production stood at 49 per cent of capacity, un- from the week previous. A further decline (p. 79); nevertheless considerable cheer is the vitality displayed in various directions. automobile production (p. 30) has declined est level of the year, some steel has been 1940 models and further purchases are the next few weeks. Tin plate demand, requirements, shipbuilding and armament are bright spots from a new business stand- ce weakness on flat-rolled products in con- th automotive requirements seems to be localized.

dwindling coal reserves is more apparent nance operations than in steel output (p. 20). es are such as to prevent fuel shortage from causing any severe curtail- ment in steel production for sev- eral weeks. . . . Office workers of United States Steel Corp. subsidi- aries (p. 21) again have been a 5-day week basis; exempted are the sub- in the Pacific coast and in Tennessee where are holding at higher rates than elsewhere. s annual compilation of distribution of fin- steel in 1938 shows (p. 15) the automoy again was the leading consumer. Build- nstruction ranked second, containers third, irth and railroads fifth. Tonnage distrib- bers showed a material gain.

ntly unveiled Crosley automobile (p. 29) ton engine, top speed of 50 miles per hour ny up to 60 miles on a gallon of gasoline.

It is priced at \$325, f.o.b. Rich- mond, Ind. . . . March iron and steel imports, excluding scrap, in- creased 38 per cent in volume over February (p. 32); German ma- les to eight most important Latin-Amer- ries now are almost twice our sales of ucts to these countries. . . . Republic Steel

Corp. (p. 33) substantially has increased its range of products in the South. . . . Both house and senate last week passed the bill (p. 25) authorizing the secretary of war to exchange obsolete for new machines and tools. . . . Two new diesel-driven, streamlined trains (p. 27) will be largely of alumi- num alloys.

. . .

That tremendous economies are possible through the use of modern machine tools on large-scale pro- duction is well understood, says Guy Hubbard; he points out (p. 38) that equally important advantages can be de- rived by using them in production involving relatively small lots. .

### Improved Steels

. . . Much progress has been made toward producing improved steel and producing it more economically, it was revealed (p. 40) by dis- cussions at the recent Open Hearth and Blast Fur- nace and Raw Materials conference. It was brought out that not more than 25 open hearth plants in this country are really fine plants. Most of the others could be rebuilt with resulting economies and other advantages. . . . Several interesting features are incorporated (p. 50) in a new electric steel plant in Detroit.

. . .

Steel barrel and drum manufacture has been com- pletely mechanized (p. 44) as a result of the devel- opment of specialized equipment by which process- ing operations and handling are combined. . . . Recently developed equipment (p. 54) automatically and continuously applies enamel to strip steel and then bakes it be-

### Progress in Enameling

fore the strip is rewound; one application of this material is in slats for Venetian blinds. . . . Welded steel fabrication is employed extensively in the construction of heavy road machinery. Massive machine frames (p. 57) have box sections; after welding, these are heated and the entire frame bull- dozed to shape while hot. The resulting parts are interchangeable. . . . Much new and improved equip- ment is available (p. 66) for production men and engineers eager to increase manufacturing efficiency.

*EC Krenzberg*





## You Wouldn't Intentionally Handicap Skilled Ha

It is often hard to determine from cost sheets exactly how much the unseen qualities of steel affect the production of your skilled shop men. If bars do not machine uniformly, if hard spots break or dull tools, if bars are too hard for bending and forming, if alloy steel parts must be re-treated to secure desired physical properties—then up go costs, down go profits.

This is one of the reasons why Ryerson has spent years in building up stocks of better, more uniform steels—steels worthy of the Ryerson seal of Certification.

All Ryerson certified carbon steels are made to rigid specifications that assure the most desirable qualities in each particular type of

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With every shipment, large or small, sends accurate data on the chemical and properties of the alloy bars furnished. Added service is given without additional charge or obligation.

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## *Certified*

# STEEL



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# Railroad Leads in Steel Consumption; Tonnage To Jobbers Gains

ING consumer classifications differ somewhat from previous years, STEEL'S compilation of distribution rolled steel shows that the automobile industry is the leading consumer. In the seventh consecutive year, railroad has held the lead in steel consumption. The automotive group accounted for 16.88 per cent of the total.

and construction, a reclassification (explained in the report) ranked second with 14.77 per cent. Containers was in third with 9.92 per cent, followed by machinery with 7.52 per cent and agriculture with 6.51 per cent. The compilation of principal consuming groups with tonnages and percentages of steel consumed, is summarized as follows:

	Gross tons	Per cent of total
Automotive	3,155,906	16.88
Engineering and construction	2,762,334	14.77
Containers	1,854,900	9.92
Machinery	1,406,067	7.52
Agriculture	1,215,364	6.51
Jobbers, warehouses, etc.	941,641	5.04

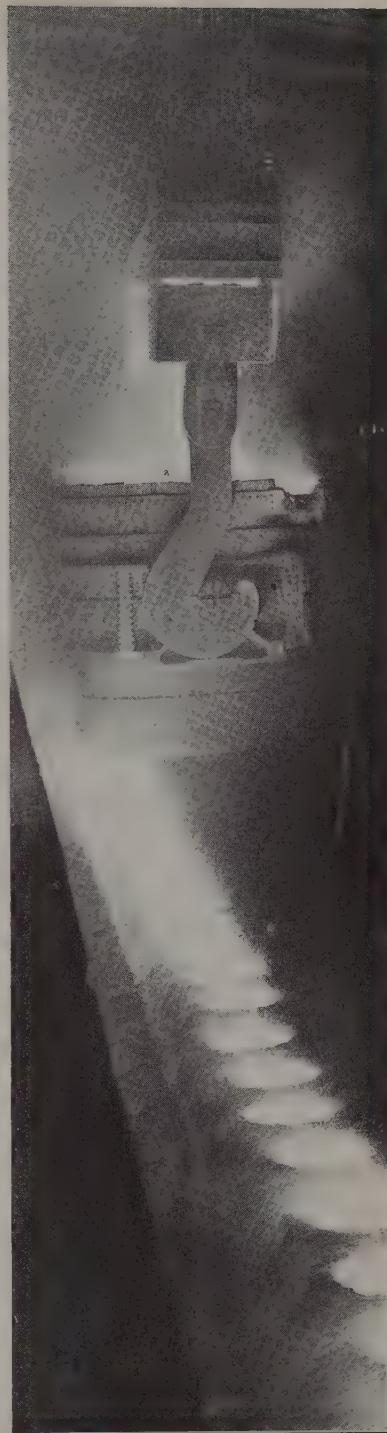
7. Machinery ..	663,041	3.55
8. Furnishings for buildings	656,955	3.52
9. Agriculture ..	414,905	2.22
Jobbers .....	3,202,619	17.13
All other ...	2,419,225	12.94

Total ..... 18,692,957 100.00

In appraising the foregoing rankings for 1938, as well as the detailed figures on tonnage and percentages in the tables on pages 16 and 17, readers should note the ways in which the consuming classifications employed in the 1938 report differ from those used heretofore.

The editors of STEEL, and of its contemporary, *The Iron Age*, have been working with the officials of leading steel companies to evolve a uniform classification which will conform to the requirements of the reporting steel companies, will provide information useful to all concerned and can be adopted by both publications. The classifications used in the 1938 report represent a transitional step in the shift from the old to a new, yet-to-be-determined classification that will fit the foregoing specification.

In 1937 and preceding years, "railroad buildings and bridges" was a sub-classification under railroads. In



## Percent of Finished Rolled Steel Taken by Principal Consuming Groups

	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926
Construction	16.88	20.04	20.87	24.04	20.87	20.95	18.15	14.78	14.10	17.57	17.76	13.34	15.09
Engineering	14.77	10.75	12.50	10.68	12.24	11.61	15.77	18.35	18.21	14.89	16.47	17.59	16.01
Containers	9.92	8.71	8.44	9.30	8.68	12.25	10.79	7.90	5.77	4.67	4.56	5.21	5.24
Machinery	7.52	6.74	3.79	3.85	5.29	3.61	3.31	4.10	4.34	4.83	5.52	5.39	5.29
Agriculture	6.51	11.16	10.52	7.27	12.37	7.29	8.30	12.55	14.97	16.70	14.87	18.70	19.90
Jobbers	5.04	5.84	5.33	4.29	4.97	4.88	5.50	9.75	9.48	9.01	7.72	8.90	9.29
Warehouses	3.55	4.88	4.96	4.37	3.65	3.63	3.39	3.37	3.80	3.81	3.48	2.79	2.65
For buildings	3.52	3.59	3.90	4.24	3.77	3.70	3.64	2.90	3.11	2.56	2.13	...	...
Other	2.22	3.66	3.57	4.74	2.42	3.01	2.76	3.56	4.51	5.27	6.34	4.42	2.70
Contributors	17.13	13.28	14.13	14.43	14.02	14.91	16.12	12.68	12.21	11.05	10.78	12.82	10.52
Total	12.94	11.65	11.99	12.79	11.72	14.16	12.27	10.06	9.50	9.64	10.37	10.84	13.31
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00



the 1938 report, this tonnage is reported under "buildings and construction."

Likewise "highways and highway bridges," which was a separate classification in previous years, is entered under "buildings and construction" in the 1938 report.

Thus in the 1938 compilation, all construction work, including building construction, is entered under a single major classification. To make this classification reflect construc-

tion activity more logically than in previous years, the "2b" classification — "furnishings, furniture, stoves, refrigerators, etc."—which formerly was under "buildings," in 1938 was excluded from "buildings and construction," and placed in a separate classification, "furnishings for buildings."

To make it possible to compare 1938 figures for the major consuming classifications with those of recent years, the percentages for the

years 1926 to 1937, included at the foot of page 1, have been regrouped to conform with the 1938 major classifications done by subtracting "railways and bridges" from "buildings and construction," and then subtracting "highways and bridges" from "all other buildings and bridges"; and then subtracting "furnishings, furniture, stoves, buildings" and entering

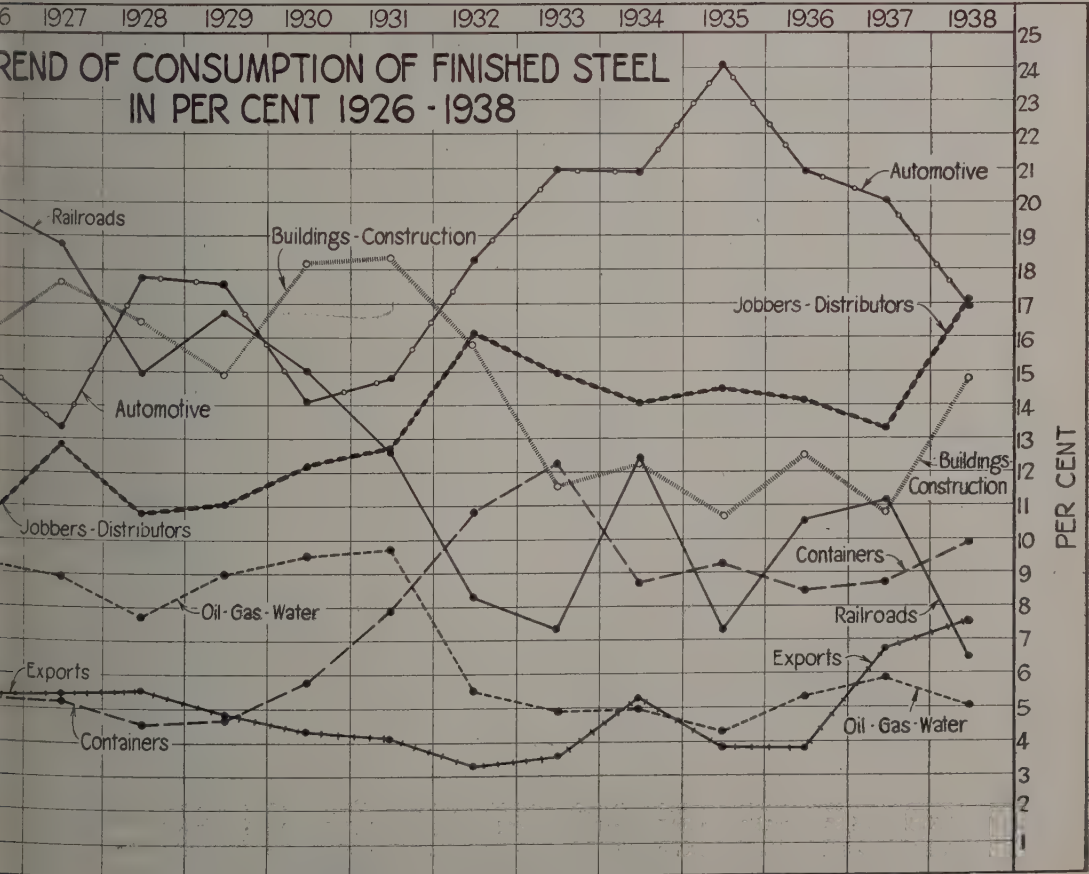
## Distribution of Finished Steel in Gross Tons to Consuming Groups

	Rails, heavy and light	Angle bars, steel ties and other track accessories	Plates	Struc- tural shapes (over 3")	Bars, except concrete bars and shapes (under 3")	Concr. bars	
1—Steel converting and processing industries:							
a. Bolt, nut, rivet and screw manufacturers..	12	30	28	64	113,687	28	
b. Forging manufacturers .....	729	17,447	741	569	50,507		
2—Jobbers, dealers and distributors .....	6,729	17,447	107,709	152,119	242,594	194,694	
3—Construction industries:							
a. Contractors, fabricators, etc. ....	5,130	234	414,975	867,462	100,621	252,511	
b. Concrete reinforcing bar fabricators and expanded metal manufacturers .....	10		804	6,354	9,671	166,827	
c. Building material, equipment manufacturers	72	872	13,356	89,026	35,097	6,211	
d. Shipbuilders .....	92	53	201,832	44,949	19,456	35	
4—Pressing, forming and stamping manufac- turing industries:							
a. Stamped and pressed steel products manufacturers .....	3	45	7,842	348	29,387	11,586	
b. Furniture and furnishings manufacturers including heating equipment and refrig- erator manufacturers .....	6	2	2,919	1,685	47,542		
5—Container industry .....	43	13	63,213	3,658	8,211	16	
6—Machinery and tool industry:							
a. Electrical machinery and equipment manu- facturers .....	50	5	34,061	11,253	30,267	40	
b. Agricultural implement and equipment manufacturers .....	49	11	23,300	19,993	150,304	53	
c. All other machinery .....	732	10	62,342	42,005	124,121	52	
7—Automotive industry .....	505	2	73,163	13,829	720,078	10,094	
8—Railroad industry:							
a. Steam and electrified railroads .....	549,334	195,596	31,851	17,037	18,698	1,948	
b. Car and locomotive builders and parts manufacturers .....	257	14,002	110,416	54,406	55,930	511	
9—Oil, public utilities, miscellaneous industries:							
a. Oil and gas producers, refiners and pipe line operators .....	42	122	61,060	22,287	11,905	608	
b. Utilities .....	5,782	1,841	22,464	6,823	1,657	14,961	
c. Mining and lumber industries .....	13,601	4,469	8,060	4,559	8,319	1,331	
d. Miscellaneous industries .....	13,321	9,621	85,230	35,647	219,176	32,161	
10—Export, all industries .....	34,675	7,074	190,245	81,314	118,272	53,241	
Grand Totals .....	630,445	251,449	1,515,611	1,475,387	2,115,500	747,994	
	All other black plate and sheets except galv.	Galvanized sheets	Strip steel	Tubing and pipe	Wire products	All other finished steel products	Gr. 1)
1—Steel converting and processing industries:							
a. Bolt, nut, rivet and screw manufacturers..	22	20	2,785	366	47,814	1,727	167
b. Forging manufacturers .....	820	15	792	671	219	768	5
2—Jobbers, dealers and distributors .....	389,290	569,087	49,925	705,283	678,949	60,050	3,201
3—Construction industries:							
a. Contractors, fabricators, etc. ....	105,644	47,404	12,467	38,237	89,550	21,004	1,951
b. Concrete reinforcing bar fabricators and expanded metal manufacturers .....	9,660	8,150	1,012	156	18,326	208	22
c. Building material, equipment manufacturers	75,668	83,564	34,270	135,532	76,399	29,525	585
d. Shipbuilders .....	3,987	1,898	405	12,771	4,327	18,227	308
4—Pressing, forming and stamping manufac- turing industries:							
a. Stamped and pressed steel products manufacturers .....	61,402	31,910	47,044	1,184	9,848	3,411	220
b. Furniture and furnishings manufacturers including heating equipment and refrig- erator manufacturers .....	389,034	32,095	68,829	6,156	73,747	14,326	656
5—Container industry .....	303,787	18,851	72,143	152	23,454	18,696	1,854
6—Machinery and tool industry:							
a. Electrical machinery and equipment manu- facturers .....	140,369	4,311	45,901	36,661	22,121	7,134	333
b. Agricultural implement and equipment manufacturers .....	32,946	38,073	39,302	5,269	90,920	14,628	414
c. All other machinery .....	23,346	4,184	20,615	26,390	12,343	12,505	329
7—Automotive industry .....	1,453,518	4,614	707,273	23,299	74,277	72,642	3,155
8—Railroad industry:							
a. Steam and electrified railroads .....	8,193	2,207	1,619	6,963	9,917	32,623	876
b. Car and locomotive builders and parts manufacturers .....	28,833	6,156	14,914	8,913	6,568	38,432	339
9—Oil, public utilities, miscellaneous industries:							
a. Oil and gas producers, refiners and pipe line operators .....	40,468	1,467	2,938	737,766	12,047	41,121	941
b. Utilities .....	803	142	654	29,581	2,299	3,457	90
c. Mining and lumber industries .....	3,477	3,630	868	3,516	10,902	10,767	73
d. Miscellaneous industries .....	244,582	94,121	212,611	126,976	285,691	97,035	1,504
10—Export, all industries .....	218,521	91,119	57,059	129,446	120,826	92,058	1,406
Grand Totals .....	3,534,370	1,043,018	1,393,426	2,035,288	1,670,544	590,344	18,692



Distribution of Finished Steel in Per Cent to Consuming Groups

	Rails, heavy and light	Angle bars, steel ties and other track accessories	Plates	Structural shapes over 3 inches	Bars, except channels and shapes under 3 inches	Concrete bars	Black plate for tinning	All other black plate and sheets except galvanized	Galvanized sheets	Strip steel	Tubing and pipe	Wire products	All other finished steel products
Forging and processing industries:													
Nut, screw manufacturers	0.01	0.01			5.37	0.04	0.01			0.20	0.02	2.86	0.29
Manufacturers	0.01	0.01	0.05	0.04	2.39			0.02		0.06	0.03	0.01	0.13
Wholesalers and distributors	1.07	6.94	7.11	10.31	11.47	26.03	1.70	11.01	54.56	3.58	34.65	40.64	10.17
Other industries:													
Machine tool fabricators, etc.	0.81	0.09	27.38	58.80	4.76	33.76		2.99	4.55	0.89	1.88	5.36	3.56
Reinforcing bar fabricators													
Welded metal manufacturers			0.05	0.43	0.46	22.30		0.27	0.78	0.07	0.01	1.10	0.03
Material and equipment													
Manufacturers	0.01	0.35	0.88	6.03	1.66	0.83	0.37	2.14	8.01	2.46	6.66	4.57	5.00
Other industries:	0.01	0.02	13.32	3.05	0.92	0.05	0.01	0.11	0.18	0.03	0.63	0.26	3.09
Arm and stamping manu-													
facturing industries:													
Forging and pressed steel products													
Manufacturers		0.02	0.52	0.02	1.39	1.55	0.98	1.74	3.06	3.38	0.06	0.59	0.58
Other industries:													
Machine tool and furnishings manufac-													
turing including heating equipment													
Refrigerator manufacturers			0.19	0.11	2.25		1.22	11.01	3.08	4.94	0.30	4.42	2.43
Other industries:	0.01	0.01	4.17	0.25	0.39		79.47	8.60	1.81	5.18	0.01	1.41	3.17
Machine tool and tool industry:													
Manufacturers			2.25	0.76	1.43		0.05	3.97	0.41	3.29	1.80	1.33	1.21
Other industries:													
Machine tool implement and equip-													
ment manufacturers	0.01		1.54	1.36	7.10	0.01		0.93	3.65	2.82	0.26	5.44	2.48
Other industries:	0.12		4.11	2.85	5.87	0.07	0.05	0.66	0.40	1.48	1.30	0.74	2.12
Machine tool machinery	0.08		4.83	0.94	34.04	1.35	0.16	41.13	0.44	50.76	1.14	4.45	12.30
Other industries:													
Electric and electrified railroads	87.13	77.79	2.10	1.15	0.88	0.26		0.23	0.21	0.12	0.34	0.59	5.53
Other industries:													
Manufacturers	0.04	5.57	7.29	3.69	2.64	0.07		0.82	0.59	1.07	0.44	0.39	6.51
Other industries:													
Utilities and miscellaneous													
Manufacturers:													
Gas producers, refiners and	0.01	0.05	4.03	1.51	0.56	0.08	0.58	1.15	0.14	0.21	36.25	0.72	6.97
Other industries:	0.92	0.73	1.48	0.46	0.08	2.00		0.02	0.01	0.05	1.45	0.14	0.58
Other industries:	2.16	1.78	0.53	0.31	0.39	0.18		0.10	0.35	0.06	0.17	0.65	1.82
Other industries:	2.11	3.83	5.62	2.42	10.36	4.30	2.84	6.92	9.03	15.26	6.24	17.10	16.44
Other industries:	5.50	2.81	12.55	5.51	5.59	7.12	12.56	6.18	8.74	4.09	6.36	7.23	15.59
Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00





major classification entitled "furnishings for buildings."

The other changes in classifications are minor, consisting chiefly of rearrangement. The division of "railroads" into "(a) steam and electrified railroads," and "(b) car and locomotive builders and parts manufacturers" seems to have caused confusion among a few reporting steel companies. For this reason it is suggested that while readers may rely upon the totals of (a) and (b) as being accurate, the division of tonnage between (a) and (b) in some cases may be open to question.

#### Method of Compiling Figures

Because many readers have inquired as to the method of compiling the distribution figures, the following explanation is presented.

Report blanks, designating consuming classifications and steel product headings as shown in the tables on pages 16 and 17, were sent to all steel producers and rolling mill operators.

Returns were received from 43 integrated companies whose steel ingot capacity totals 70,572,500 gross tons, or 97 per cent of the steel ingot capacity as of Dec. 31, 1938, of 72,533,969 gross tons computed by the American Iron and Steel Institute, and from 32 non-integrated companies operating rolling mills but having no steel ingot capacity.

STEEL's object in soliciting returns from non-integrated companies is to obtain a breakdown of the distribution of the steel rolled from the 2,191,316 tons of semi-finished steel which the integrated companies reported as having been shipped by them to other companies for further conversion.

The reports from integrated and non-integrated companies account for the distribution of 18,692,957 gross tons of finished rolled steel. This compares with the American Iron and Steel Institute's reported production in 1938 of 20,993,315 gross tons, which however includes semi-finished steel to the amount of 2,515,360 gross tons. An accurate comparable figure could be determined only by applying a conversion factor to this tonnage of semifinished material, converting it into terms of finished rolled steel, and adding

## Distribution by Percentage of Alloy Steel in

Shown by Consuming Groups and Individual Products									
Group	Hot rolled bars	Cold drawn bars	Sheets	Plates	Pipe and tubes	Wire	Structural shapes	Hot rolled strip	Cold rolled strip
Automotive.	65.62	42.38	8.46	3.11	0.78	30.58	0.95	64.80	22.31
Machine tool	7.49	11.17	0.63	12.80	2.43	1.82	16.41	1.99	0.71
Railroad	1.25	0.26	5.63	17.57	0.66	0.49	47.80	1.51	0.01
Agricultural	2.46	0.97	0.26	0.04	.....	.....	.....	0.94	0.21
Construction	0.93	.....	1.71	11.83	3.21	.....	24.34	0.33	1.81
Shipbuilding	0.57	.....	0.54	12.53	4.69	.....	3.36	.....	0.05
Oil industry	0.78	0.37	0.13	9.54	25.06	.....	.....	0.02	0.11
Exports	5.10	2.43	8.53	5.28	7.31	0.77	3.98	11.14	3.31
All other...	15.80	42.42	74.11	27.30	55.86	66.34	3.16	19.27	71.43
Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

that figure to the 18,477,955 gross tons of finished rolled steel in the institute's compilation.

The semifinished steel referred to consists of 1,708,067 tons of ingots, blooms, billets, slabs, sheet bars, etc.; 394,977 tons of skelp; and 412,316 tons of wire rods. The conversion loss from ingots to finished steel may be as high as 30 per cent and from wire rods to wire products as low as a few per cent.

If, considering the preponderance of heavy semifinished tonnage involved (blooms, slabs, etc., including ingots, one can arbitrarily assume a loss of 15 per cent in conversion to finished steel, then the 2,515,360 tons of semifinished shrinks to 2,138,066 tons. This added to the 18,477,955 tons gives a computed total of 20,741,779 gross tons of finished rolled steel, based upon the institute's figures. (The foregoing calculations can be understood more clearly by referring to the institute's figures presented on page 35 of the Feb. 13, 1939, issue of STEEL).

Thus STEEL's reported distribution of 18,692,957 tons accounts for 90 per cent of the total tonnage of finished steel rolled in 1938.

No estimates were used in the compilation. All reports were entered as received, except that in the case of one large and seven very small companies where the distribution of tonnages was not in sufficient detail to be classified intelligently, the tonnage under each steel product heading was arbitrarily distributed in accordance with the percentages derived from all other returns.

Analysis of the returns shows no striking change in consumption from recent years. It is significant that

"exports" accounted for a percentage of total steel less than in any year since 1917.

Also it is noteworthy that the percentage handled by jobbers and distributors of steel going to any one classification. The tonnage by jobbers was slightly greater than that taken by the automotive industry. A check shows that the first year in which the tonnage distributed through jobbers that accounted for by the consuming classification.

## Several Shifts in Alloy Steel

Several shifts in the distribution of alloy steel are revealed by the tonnages reported for 1938. The automotive industry retained its place by a wide margin as the proportion dropped marginally that in 1937. Machine tool production in 1937, rose to second rank. Exports jumped from first third in 1938; while railroad tonnage moved from second to fourth place; oil industry moved up to fifth; agricultural tonnage moved from fourth to sixth. Shipbuilding held to seventh and ship repair to eighth.

Total alloy tonnage in 1938 was 446,715 gross tons, or 532,298 tons, or 54.3 per cent less than the 1937 total of 800,000 tons. Since production of open hearth and Bessemer steel ingots reported by the American Iron and Steel Institute, showed a 43.8 per cent drop from 1937 to 1938, it is apparent that output of alloy steel suffered much more sharply than that of carbon steel.

STEEL's alloy figures for 1938 are two years without doubt the most accurate analysis of tonnage distribution than those presented previously, because a larger number of companies producing alloy steel have reported their tonnages available for 1938. This fact, however, the figures should be regarded as indicative rather than conclusive, for returns for 1937 were not yet thoroughly representative of the alloy steel industry. More returns conceivably would

## Use of Alloy Steel, by Consuming Industry, 1930-1938

Group	Gr. Tons Reported	Percentage of Consumption by Groups								
	1938	1938	1937	1936	1935	1934	1933	1932	1931	1930
Automotive . . . .	241,237	54.00	59.68	59.78	72.22	53.31	68.28	77.64	72.67	62.23
Machine tools. . . .	30,657	6.86	6.75	6.57	4.47	4.88	3.57	3.54	6.17	8.95
Railroads . . . . .	10,845	2.43	7.01	6.96	2.30	4.71	0.92	1.92	1.83	2.66
Agricultural . . . .	7,839	1.76	1.88	3.03	2.87	2.42	2.07	1.69	3.30	5.94
Construction . . . .	7,656	1.71	0.74	0.45	0.94	1.55	0.66	0.68	1.09	1.00
Shipbuilding . . . .	6,049	1.36	0.37	0.44	0.39	1.21	0.47	0.42	0.52	0.79
Oil industry . . . . .	8,142	1.82	0.94	1.07	1.77	1.52	1.96	0.82	1.16	4.73
Exports . . . . .	24,282	5.44	1.69	1.00	0.58	0.58	0.29	0.43	0.88	1.16
Miscellaneous . . . .	109,978	24.62	20.94	20.70	14.46	30.42	21.78	12.86	12.38	12.54
Totals . . . . .	446,715	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00



ersity in distribution, per-  
expense of the automo-  
y's proportion.

to 1938 reports to STEEL,  
ive industry accounted  
cent of the alloy steel  
t 59.68 per cent in 1937.  
tion taken by this in-  
adually declining. Aver-  
eight years, 1930-1937,  
r cent, with a high point  
cent in 1932.

ine tool industry took  
t of the alloy steel total  
ainst 6.75 per cent in  
ts increased from 1.69  
5.44 per cent last year.  
ropped from 7.01 per  
to 2.43 per cent in 1938.  
stry raised its percent-  
4 in 1937 to 1.82 in 1938;  
ulture lowered its from  
Construction and ship-  
seventh and eighth posi-  
ectively, showed small  
uction going from 0.74  
1.71 in 1938, and ship-  
ment 0.37 to 1.36 per cent.  
whelming proportion of  
roduction is distributed  
of hot rolled bars. How-  
product showed a loss last  
ing from 74.76 per cent  
4.82 per cent. Hot rolled  
8 accounted for 289,586  
446,715 tons reported.

ets rose from fourth  
937 to second in 1938;  
tages of 3.56 and 8.44,  
Forgings, second in  
5.30 per cent, went to  
8 with 5.49 per cent.  
s were found in cold  
s, hot rolled strip, cold  
plates, pipe and tubes;  
registered in structural  
and tool steel.

## Old Companies' s Depict Progress

ades' growth was im-  
demonstrated by Cleve-  
machine tool, equipment  
ndustries last week with  
plays in windows of the  
department store ob-  
e fortieth anniversary.  
e 1899 and 1939 model  
ith explanatory data on

## District Steel Rates

Percentage of Ingot Capacity Engaged  
in Leading Districts

	Week ended May 6	Change	1938	Same week 1937
Pittsburgh ...	44	+ 1	25	93
Chicago .....	47	- 2.5	32.5	83
Eastern Pa. ...	36	- 1	27.5	73.5
Youngstown...	43	None	30	83
Wheeling ....	64	+ 1	41	94
Cleveland ...	44.5	+ 5.5	28	79.5
Buffalo .....	35	- 2.5	28	92
Birmingham..	55	None	66	83
New England	45	None	30	90
Cincinnati ...	52	None	40	94
St. Louis.....	51	+ 9	36.3	94
Detroit .....	59	None	18	100
Average....	49	None	31	91

the companies' development.

Those participating and their  
exhibits: Republic Steel Corp.,  
stainless steel and household prod-  
ucts; American Shipbuilding Co.,  
ship models; Case School of Ap-  
plied Science, wind tunnel showing  
effect of streamlining automobiles;  
Foote-Burt Co., small drill press,  
cutouts of larger machines and pro-  
cessed motor block; Addressograph-  
Multigraph Corp., machines; George  
Worthington Co., exhibit of contrast  
in household furnishings, hardware;  
Thompson Products Inc., model air-  
planes and aircraft parts; Electric  
Controller & Mfg. Co. and General  
Electric Co., electrical equipment.

## New Company To Build Carbon Electrode Plant

■ Great Lakes Carbon Corp., re-  
cently organized under Delaware  
charter by interests associated with  
Great Lakes Coal & Coke Co., Chi-  
cago, will build a carbon electrode  
plant at Niagara Falls, N. Y. The  
plant will be on a 15-acre site, cost  
\$1,000,000, and employ about 150  
workers. It will produce amorphous  
carbon electrodes and graphite elec-  
trodes and anodes.

Executive offices of the company  
are at 30 Rockefeller Plaza, New  
York. B. E. Broadwell, Lewiston,  
N. Y., consulting engineer, will su-  
pervise construction and operation.

## PRODUCTION

■ STEELWORKS operations last  
week averaged 49 per cent, un-  
changed from the preceding week.  
Reductions were noted in three dis-  
tricts, advances in four, and five  
were steady. A year ago the rate  
was 31 per cent.

**Youngstown, O.**—With 40 open  
hearthths and three bessemers in pro-  
duction the rate remained 43 per  
cent for the third week. One in-  
terest has two blast furnaces on  
slow blast.

**Chicago**—Down 2.5 points to 47  
per cent as one producer suspended  
bessemer activity and open hearths  
were taken off at two other plants.  
The leading interest made a slight  
increase.

**Birmingham, Ala.**—Unchanged at  
55 per cent with 11 open hearths in  
production.

**Cincinnati**—Steady at 52 per cent,  
the same schedule indicated for this  
week. Some ingots may be stocked  
if finishing mill output declines.

**St. Louis**—Advanced 9 points to  
51 per cent, matching finishing mill  
demand. Two open hearths have  
been added.

**Cleveland**—Increased 5.5 points to  
44.5 per cent as one interest lighted  
additional open hearths preparatory  
to shutting down several units for  
repairs.

**Buffalo**—Reduction of 2.5 points  
to 35 per cent resulted from drop-  
ping one open hearth.

**Central eastern seaboard**—Off 1  
point to 36 per cent on adjustments  
by several interests.

**Detroit**—Held at 59 per cent, 14  
open hearths being in production.  
One Great Lakes blast furnace was  
taken off Tuesday and one which  
has been banked resumed blowing.

**New England**—Continued at 45  
per cent, with indications for the  
same rate this week.

**Pittsburgh**—Slight increase by  
larger mills moved the rate up 1  
point to 44 per cent.

**Wheeling**—Minor changes resulted  
in a gain of 1 point to 64 per cent.

## Launch 18-Knot Tanker

■ Second of three fast national-de-  
fense tankers, which Federal Ship-  
building & Dry Dock Co., Kearny,  
N. J., United States Steel Corp.  
subsidiary, is building for Standard  
Oil Co. of New Jersey, was launched  
recently.

Christened NEOSHO by Mrs. Emory  
Land, wife of Rear Admiral Land,  
chairman of United States maritime  
commission, the ship is 553 feet  
over all, has 18,000 tons deadweight  
capacity and 6,000,000 gallons oil-  
carrying capacity, 12,000 miles  
radius of action and speed exceed-  
ing 18 knots.

## of Alloy Steel, by Finished Form, 1930-1938

Gr. Tons Reported	Percentage of Consumption by Products—									
1938	1938	1937	1936	1935	1934	1933	1932	1931	1930	
289,586	64.82	74.76	77.32	84.62	68.73	69.81	77.28	54.48	70.50	
19,412	4.34	2.64	2.54	4.32	14.99	19.05	11.68	25.65	5.32	
37,704	8.44	3.56	3.41	2.03	10.20	1.29	1.14	0.69	0.94	
16,512	3.70	2.97	1.76	0.78	1.28	0.59	0.65	1.95	3.05	
15,126	3.39	0.92	1.11	0.78	1.75	3.57	4.80	8.60	8.84	
2,861	0.64	0.71	1.57	1.15	0.25	0.33	0.28	0.06	0.08	
3,040	0.68	1.35	1.73	0.31	0.19	0.01	0.12	0.07	0.42	
19,294	4.32	4.14	6.91	5.01	0.49	2.88	0.66	1.31	3.86	
5,488	1.23	0.67	0.46	0.38	0.35	0.51	0.43	0.04	0.06	
13,162	2.95	2.98	2.88	0.42	1.60	0.48	1.07	2.03	0.80	
24,530	5.49	5.30	0.31	0.20	0.17	1.48	1.89	5.12	6.13	
446,715	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	



# 22 Blast Furnace Stacks Banked or Blown Out; Coal Shortage a Factor

■ PRODUCTION of coke pig iron in the United States in April averaged 68,793 gross tons daily, a decrease of 8408 tons, or 10.9 per cent, compared with the 77,201 tons in March. It was the lowest daily average since October, 1938, with 66,694 tons. April, 1938, production averaged 46,267 tons.

Production undoubtedly was influenced by the need for conserving coal, as 22 stacks were blown out or banked and only one blown in during the month.

Total production in April was

## MONTHLY IRON PRODUCTION

	Gross Tons		
	1939	1938	1937
Jan.....	2,175,423	1,444,862	3,219,741
Feb.....	2,060,183	1,306,333	3,020,006
March.....	2,393,255	1,470,211	3,470,470
April.....	2,063,080	1,388,008	3,400,636
Tot. 4 mo..	8,691,941	5,609,414	13,110,853
May.....	1,260,937	3,545,180	
June.....	1,060,747	3,115,302	
July.....	1,213,076	3,501,359	
Aug.....	1,495,514	3,616,954	
Sept.....	1,683,097	3,417,960	
Oct.....	2,067,499	2,891,026	
Nov.....	2,286,661	2,007,031	
Dec.....	2,212,718	1,503,474	
Total...	18,889,663	36,709,139	

2,063,080 tons, 330,175 tons, or 13.8 per cent, less than in March.

Output for the first four months this year amounted to 8,691,941 tons, 3,082,527 tons, or 55 per cent, more than 5,609,414 tons produced in the like period of 1938.

Relating production to capacity, operations in April averaged 50 per cent. This was lowest since October, 1938, with 48 per cent, and compares with 33.4 per cent in April, 1938.

Number of stacks in blast April 30 was 102, or 21 less than at the close of March. Two merchant stacks were made inactive and one put in blast. Twenty steelworks furnaces were blown out or banked. April total of 102 is lowest since September, 1938, when 97 were active.

Furnace resuming during April was: In Pennsylvania: Brooke, E. & G. Brooke Iron Co.

Stacks blown out or banked were: In Alabama: Ensley Nos. 2, 5 and 6, Tennessee Coal, Iron & R. R. Co. In Illinois: South Works Old No. 2 and South Works No. 5, Carnegie-Illinois Steel Corp. In Indiana: Gary No. 8, Carnegie-Illinois Steel Corp.; Madeline No. 1, Inland Steel

Co. In Michigan: Detroit, National Steel Corp. In New York: Buffalo, National Steel Corp. In Ohio: Massillon, River No. 1 and Youngs-

## AVERAGE DAILY PRODUCTION

	Gross Tons			
	1939	1938	1937	1936
Jan.....	70,175	46,608	103,863	65,461
Feb.....	73,578	46,655	107,857	63,411
March...	77,201	47,426	111,951	66,004
April....	68,793	46,267	113,354	80,316
May.....	40,675	114,360	85,795	
June.....	35,358	103,843	86,551	
July.....	39,131	112,947	83,735	
Aug.....	48,242	116,676	87,475	
Sept.....	56,103	113,932	90,942	
Oct.....	66,694	93,259	96,509	
Nov.....	76,222	66,901	98,331	
Dec.....	71,378	48,499	100,813	
Ave. ....	72,433	51,752	100,573	83,832

town No. 2, Republic Steel Corp.; Campbell No. 3 and Hubbard, O., No. 1, Youngstown Sheet & Tube Co.; Ohio No. 1, Carnegie-Illinois Steel Corp. In Pennsylvania: Cambria L, Bethlehem Steel Corp.; Donora, American Steel & Wire Co.; Duquesne Nos. 3 and 4, Edgar Thomson E and Farrell No. 2, Carnegie-Illinois Steel Corp. In West Virginia: Riverside, Wheeling Steel Corp.

Dismantling of the Jenifer blast furnace of the Jenifer Iron Co. at Jenifer, Ala., is now under way. This stack, built in 1901 and rebuilt in 1918, has been idle since 1920. It had an annual capacity of 50,000 tons of foundry pig iron. The unit was sold to a Birmingham, Ala., scrap dealer for demolition. With removal of this stack, total potential

## APRIL IRON PRODUCTION

	No. in blast		Total tonnage	
	last day of	Mer-	Non-	
	Apr. Mar.	chant	merchant	
Alabama ...	11 14	66,427	124,494	
Illinois .....	7 9	38,362	145,836	
New York....	7 8	30,463	106,912	
Ohio .....	24 30	44,929	413,158	
Penna. ....	30 35	23,825	528,294*	
Colorado ...	2 2			
Indiana .....	8 10	3,016*	377,904	
Maryland ...	4 4			
Virginia ....	1 1			
Kentucky ...	1 1			
Mass. ....	0 0			
Michigan ....	3 4			
Minnesota ...	1 1	0	159,450	
Missouri ....	0 0			
Tenn. ....	0 0			
Utah .....	1 1			
West Va.....	2 3			
Total .....	102 123	207,032*	1,856,048*	

\*Includes ferro and spiegeleisen.

furnaces in the United States reduced from 237 to 236.

Most steelworks cut several more weeks seriously handicapped shortage, reports from producing districts indicate turn to other forms of tain requirements.

A majority of the 22 blast stacks shut down in banked, indicating a when differences of mine erators are settled.

Closing of mines in West and West shut off tant source of supply consumers. Bituminous the week ended April 29, 1939, 1,000 tons, but with the pensions about 95 per cent industry is affected. Mi by members of the Miners of America, the Federation of Labor union to operate.

The supply of coal on hand would last 39 days if it could be evenly distributed.

## RATE OF OPERATION

(Relation of Production to Capacity)

	1939 <sup>1</sup>	1938 <sup>2</sup>	1937 <sup>3</sup>
Jan.....	51.0	33.6	
Feb.....	53.5	33.6	
March.....	56.1	34.2	
April.....	50.0	33.4	
May.....	29.4		
June.....	25.5		
July.....	28.2		
Aug.....	34.8		
Sept.....	40.5		
Oct.....	48.0		
Nov.....	55.0		
Dec.....	51.4		

<sup>1</sup> Based on capacity of 50,000 tons, Dec. 31, 1938; <sup>2</sup> capacity of 49,512,737 tons, Dec. 31, 1937; <sup>3</sup> capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,512,737 tons, June 30, 1937; <sup>4</sup> capacity of 49,512,737 tons, Dec. 31, 1935. Source: American Iron and Steel Institute.

all consumers. This is in a report from the National Association of Purchasing Agents. However, the problem of the supply has become more acute and instances of shortage some users have increased.

Likelihood was seen that shipments from northern would be delayed until strike is ended. Ore usually carry coal north with ore. Coal accumulation Lake Erie ports for war material have been reduced inland needs, although the carryover from last year.

■ Mining and industrial shipments for first quarter compared with 67 in first and 102 in fourth quarter, department of commerce reported.



# ICIAL

## STATEMENTS

EL CO., Cleveland, first profit \$228,804 after except provision for fed-tax, equal to 4 cents a are, comparing with \$297,379 in the initial Indicated net profit quarter was \$52,779.

uel & Iron Corp., Den- arter net profit \$163,- o 29 cents a common he fourth quarter last s was \$661,908, and in quarter net loss \$389,-

Steel Co., Pittsburgh, r net loss \$377,159, loss of \$277,230 in first year.

ity Steel Co., Granite rst quarter net profit t loss of \$155,093 was the comparable 1938

Rolling Mill Co., Balti-

more, first quarter net loss \$28,017; net loss in first quarter last year was \$86,225.

Interlake Iron Corp., Chicago, first quarter net loss \$350,678, compared with net income of \$28,266 in the initial 1938 quarter.

For tabular comparison of first 14 steel producers to issue first quarter statements, see STEEL, May 1, p. 16.

## DIVIDENDS DECLARED

Clark Equipment Co., Buchanan, Mich., 25 cents on common, payable June 1 to record May 13.

Otis Elevator Co., New York, 15 cents on common, payable June 20 to record May 26.

Warren Foundry & Pipe Corp., New York, 50 cents on common, payable June 1 to record May 15.

Timken Roller Bearing Co., Canton, O., 25 cents on capital stock, payable June 5 to record May 16.

Eaton Mfg. Co., Cleveland, 50 cents on capital stock, payable May 25 to record May 15.

# LABOR

## SALARIED EMPLOYES PLACED ON 5-DAY WEEK

■ MAJORITY of United States Steel Corp. subsidiaries last week placed salaried employes on a five-day week basis, with corresponding reductions in compensation. Exceptions are Tennessee Coal, Iron & Railroad Co. and Columbia Steel Co. Shorter work week for office employes, necessitated by lower operations, reverts to the schedule in effect last year, and which was terminated Jan. 1. Base salary rates remain unchanged.

## MARCH STEEL PAYROLLS HIGHEST IN 16 MONTHS

Steel industry payrolls in March totaled \$64,174,000, highest in 16 months and more than 12 per cent above February, according to the American Iron and Steel institute. Number employed likewise increased during the month to an average of more than 455,000, compared with 453,000 in February.

Hourly earnings of the 399,000 wage-earning employes at work in March averaged 82.8 cents per hour, against 82.7 cents in February, and 81.8 cents in March, 1938. Average number of hours worked per week was 34.7 in March, 33.5 in February and 26.7 in March last year.

Study of monthly steel payrolls and employment shows the number of wage earners has shown relatively little change from month to month in comparison to fluctuations in production. From September, 1933, through September, 1937, trend in number employed was generally upward. Occasional minor upward and downward trends in production were reflected only to a limited extent, if at all, in employment.

After September, 1937, the employment curve turned downward, reflecting a sharp decrease in production. However, a 32 per cent decrease in employment compares with a 69 per cent drop in production from September, 1937, to the low point in 1938.

United States steelworkers in 1938 earned from two to nine times the hourly rates paid in foreign countries. Average American steel wage of 83 cents compares with 40 cents in Great Britain, 38½ cents in France, 35 cents in Germany, 30 cents in Russia and Sweden, 24 cents in Belgium, 16 cents in Italy and 9½ cents in Japan. Average for steelworkers in the eight foreign countries last year was 31½ cents.

■ Approximately 1,069,000 pounds of steel were absorbed in the manufacture of new golf clubs last year, estimates the American Iron and Steel institute.

## Consumers' Net Income Up 172 Per Cent

net income of 115 companies among equipment manufacturers, and consumers in the first quarter aggregated \$37,545,831, or 172 per the \$13,803,497 income reported by them in the first quarter STEEL'S tabulation April 24, page 19, included 31 companies; the May 1, page 16, included 42, while the following table also lists of the 115 companies recorded a loss in the first quarter, while deficit in the same period last year. All figures are net income, re asterisk denotes loss.

	First Quarter		First Quarter Income Per Common Share	
	1939	1938	1939	1938
Co., Pittsburgh	\$ 122,998	\$ 209,681*	\$0.09	\$1.17*
Mfg. Co. Inc., Corry, Pa.	16,800	33,600	0.03	0.07
Co. Inc., New York	1,027,255	795,590	0.40	0.31
ts Corp., Detroit	12,771*	44,211*	0.54*	0.96*
Corp., Fairhaven, Mass.	28,044	5,450*	0.29	0.06*
ilcox Co., New York	512,690*	730,563*	0.71*	0.82*
er Mfg. Co., Towson, Md.	137,425	83,491	0.37	0.22
Corp., Chicago	1,154,705	287,673*	0.50	0.12*
Co., Detroit	958,047	317,007	0.48	0.16
el Co., Reading, Pa.	137,073	106,476*	0.38	0.30*
way Equipment Co., Chicago	10,835*	65,684*	0.90*	1.81*
Steel Corp. Ltd., Los Angeles	141,483	68,021	0.33	0.02
.. Cincinnati	208,916	25,775*	0.38	0.05*
st Corp., New York	1,698,157	733,910	0.15	0.02
-Lite Co., Toledo, O.	1,620,903	32,242*	1.35	0.03*
um Cleaner Co., Detroit	27,086*	68,213*	0.12*	0.28*
ation Corp., Woodside, L. I., N. Y.	56,254	38,432	0.17	0.11
Works, Detroit	14,004*	57,012*	0.20*	0.42*
ery Corp., Dunedin, Fla.	253,056	214,397	0.49	0.40
Cleveland	6,722*	16,280*	0.03*	0.06*
actories Co., Pittsburgh	61,948	104,606	0.13	0.22
e Instruments Corp., New York	125,276	102,279	0.22	0.13
e Business Machines Corp., New York	2,244,817	2,080,170	2.62	2.55
ove & Furnace Co., Kalamazoo, Mich.	124,485*	80,267*	0.41*	0.27*
s Wheel Co., Detroit	324,716	353,783*	0.59	1.79*
Inc., Long Island City, N. Y.	94,869*	254,349*	0.16*	0.43*
Newtown, Iowa	390,928	83,323	0.07	0.11*
l Products Co., Cleveland	540,966	171,881	1.37	0.20*
an Aviation Inc., Inglewood, Calif.	1,355,952	212,085	0.39	0.06
rine & Mfg. Co., Waukegan, Ill.	191,542	136,262	0.64	0.46
Co., New York	957,627	798,113	0.43	0.35
or Car Co., Detroit	230,329	389,340*	0.02	0.03*
oal Co., Pittsburgh	369,914*	769,174*	2.25*	3.26*
crew & Bolt Corp., Pittsburgh	8,126*	97,255*	0.01*	0.06*
r Car Co., Pittsburgh	237,906*	336,081*	0.62*	0.93*
& Steel Co., Fitchburg, Mass.	216,111	22,974	0.43	0.05
chinery Co., Michigan City, Ind.	61,908*	157,040*	0.33*	0.84*
oler Corp., Detroit	43,813	83,960*	0.11*	0.93*
ment Co., San Francisco	1,022*	1,344	0.23*	0.20*
tt Co., Troy, Q.	12,520*	31,438*	0.09*	0.22*
nautical Corp., Paterson, N. J.	1,231,725	586,288	2.05	0.98
k & Coach Mfg. Co., Pontiac, Mich.	388,799	117,575	0.05	0.04*



# MEN OF INDUSTRY

■ PAUL COE NICHOLSON has been elected president and general manager, Nicholson File Co., Providence, R. I., succeeding his father, the late Col. Samuel M. Nicholson. Mr. Nicholson received his education in the schools of Providence, St. Paul's school at Concord, N. H., and supplemented by a course at Yale university where he graduated in 1911. Shortly thereafter he joined the Nicholson company, serving in various departments to learn the business thoroughly. In 1913 he was elected vice president, and in 1915 assumed the additional duties of treasurer. Mr. Nicholson is also president, American Screw Co., and John R. White & Son Inc.; and a director, Industrial Trust Co., Industrial Holdings Inc., Rhode Island Insurance Co., Merchants Insurance Co., and Narragansett Electric Co.



Paul C. Nicholson

following graduation from the University of Kentucky in June, 1926, and after taking a special sales training course, was associated with the home offices. In July, 1928, he was sent to New York, and the following year was made a salesman in the Detroit office.

Harry C. Delzell has been elected executive secretary, Concrete Reinforcing Steel institute, Chicago. Formerly with Portland Cement association, Mr. Delzell succeeds Mark Beeman, who resigned because of ill health.

R. B. Mildon, vice president, formerly in charge of the East Pittsburgh division, Westinghouse Electric & Mfg. Co., has been transferred to Pittsburgh headquarters for special sales assignments. A. C. Streamer, manager, switchgear division, has been appointed general manager, East Pittsburgh division.

Mr. Mildon, associated with Westinghouse since 1906, and a vice president since 1934, went to Pittsburgh

in April, 1938, from where he had been in the south Philadelphia steam engine division. Mr. Streamer, Westinghouse in 1907, completing the apprenticeship course was assigned to switchboard engineering department. In 1931 he was appointed general manager, and was appointed head of the switchgear division when it was formed.

Melvin Pattison, heretofore president and treasurer, Brownhoist Corp., Bay City, Mich., has been elected chairman of the board. Hoyt E. Hayes, Detroit, succeeds Mr. Pattison as president and treasurer, and J. W. Hayden, assistant sales manager, has been appointed sales manager.

C. C. Ziegler, formerly district manager, Greenfield, Mass., has been elected president in charge of the East Pittsburgh headquarters at the main office, Greenfield, Mass. He succeeded at Chicago by Bryant, formerly manager of the gage department. Edward J. Ziegler, heretofore sales promotion manager, has been named eastern sales manager, with headquarters in New York, succeeding Charles H. Coe. Glen Stirling, engineer at Detroit, has been transferred to Greenfield as sales manager.

These changes were the result of the resignation of W. B. duMont, president in charge of the East Pittsburgh division, Elliott C. Paddock, assistant manager.

Marvin W. Smith, manager of the switchgear division, Westinghouse Electric & Mfg. Co., East Pittsburgh, has been elected a vice president of the company. Mr. Smith, who has been at the Pittsburgh headquarters in Pittsburgh since 1924, graduated from Texas Agricultural and Mechanical college in



Foster E. Wortley



R. B. Mildon



A. C. Streamer



C. C. Ziegler



direct all the company's activities. He is a member of the American Association for the Advancement of Science and the Institute of Electrical Engineers. He has produced several articles in the electrical field and is the author of many technical papers.

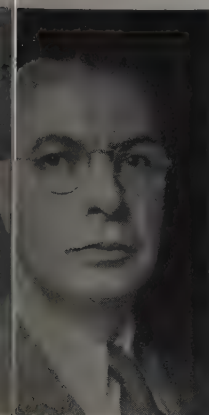
Shelley, associated with the Coal, Iron & Railroad Company, Birmingham, Ala., the past year as a sales engineer, has



L. H. Shelley

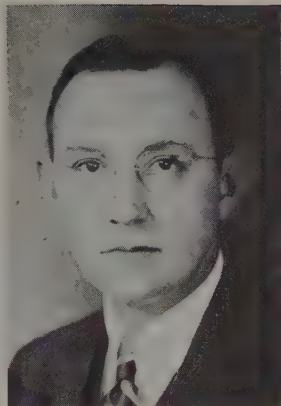
acted as manager of sales in the new culvert division. He is responsible for the manufacture of culverts being installed in the fabricating shop at Fairport, N.Y. Both plain galvanized and half-coated culverts will be made in all standard sizes and

Wolff, assistant director of the Westinghouse Air Brake Company and subsidiaries, Pitts-



H. W. Wolff

including the Union Switch & Signal Co., has been promoted to the position of purchases, succeeding J. Forrester, who has re-

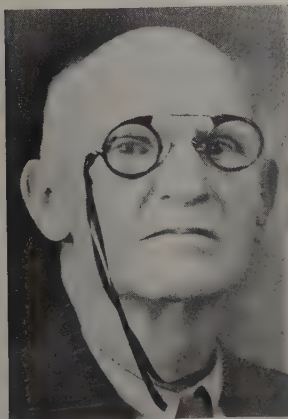


Marvin W. Smith

tired after 49 years of continuous service with Westinghouse Air Brake. After high school and business college training, Mr. Wolff joined Hall Switch & Signal Co., Garwood, N. J., and successively became purchasing agent, works manager, general manager and treasurer, and a director. When the Hall company was absorbed by Union Switch & Signal in 1925, he served the latter company in a general executive capacity, and in 1937 was made assistant director of purchases of the Air Brake company.

## DIED:

■ FRANK B. McKUNE, 72, superintendent, Steel Co. of Canada Ltd., Hamilton, Ont., in Hamilton, May 1, after an illness of several months. Mr. McKune joined the company in 1899, being appointed the first superintendent when open-hearth furnaces at the new Hamilton works were first installed. A leading figure in the Canadian steel industry, Mr. McKune was credited with many important improvements in the art of steelmaking and particularly in open-hearth furnace design. He was



F. B. McKune

active with the open-hearth committee of the American Institute of Mining and Metallurgical Engineers.

John Andrews Anderson, 44, general foreman of blast furnaces, Farrell plant, Carnegie-Illinois Steel Corp., in Farrell, Pa., April 24.

Robert M. Rubush Sr., 47, for many years metallurgist, Machined Steel Casting Co., Alliance, O., in Alliance, recently.

William P. McFarlane, 75, secretary-treasurer of Murray Body Co., Detroit, until his retirement 15 years ago, April 14 near Pontiac, Mich.

Clinton W. Howard, vice president and sales manager, Rickert-Shafer Co., manufacturer of die heads, tapping and threading machinery, Erie, Pa., in that city, April 19.

Carl H. Rock, 63, formerly vice president and sales manager, Vlchek Tool Co., Cleveland, at his home in Chagrin Falls, O., April 30.

William Heyburn, 77, former chairman of the board, Belknap Hardware & Mfg. Co., Louisville, Ky., and prominent civic leader, in Louisville, April 21.

Isidor Kutz, 62, president, Martin Co., Cleveland, metal products manufacturer, and head of its predecessor companies for 20 years, recently in that city.

Lawrence M. Viles, chairman, Buda Co., Harvey, Ill., maker of railroad supplies and marine engines, recently in Chicago. He was president from 1918 until two years ago when he was named chairman.

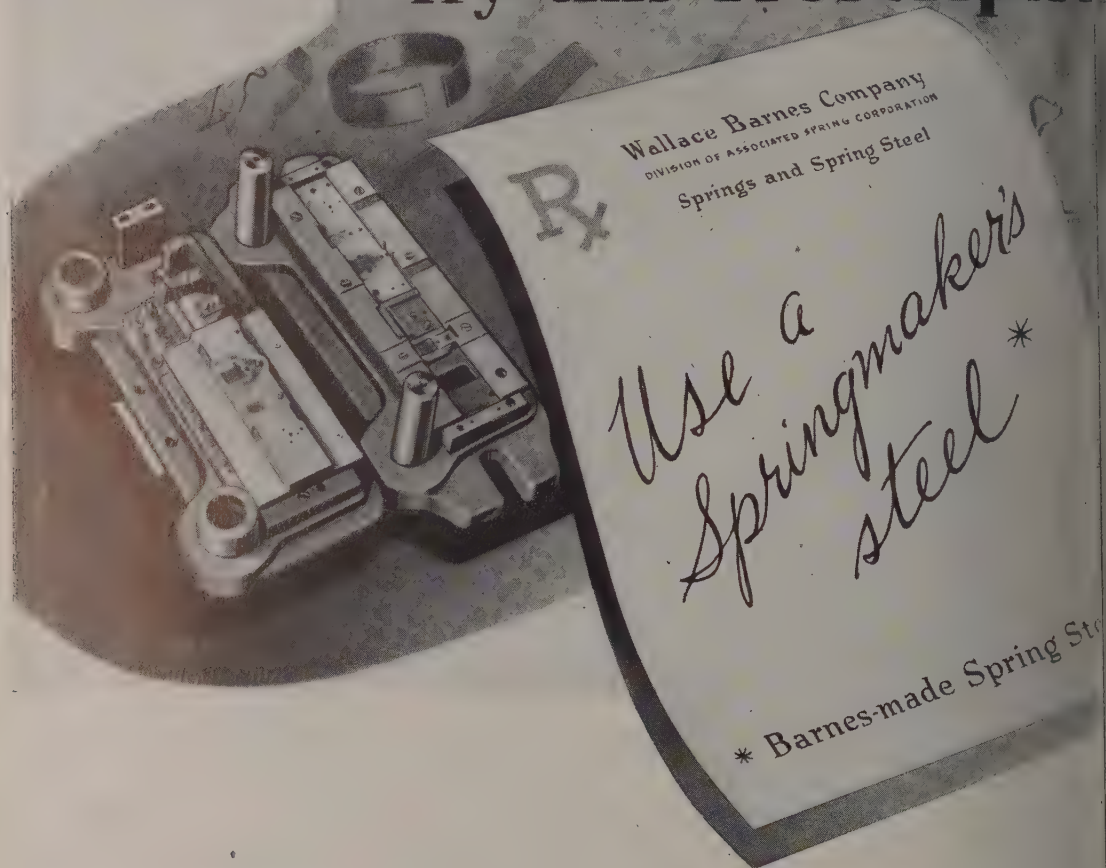
Frank Matthiessen, 67, retired vice president and director, Columbia Tool Steel Co. and Gisholt Machine Tool Co., in Passavant hospital, Chicago, May 2. Mr. Matthiessen, who retired ten years ago, had formerly been with General Electric Co., Machinists' Supply Co. and Miehle Printing Press & Mfg. Co.

John Farris, president, Farris Engineering Co. and the Mausoleum Construction Co., April 15 in Oakland, Pittsburgh. He entered the bridge construction business about 20 years ago, becoming president of the engineering firm in 1915. He was a past president, Pittsburgh section, American Society of Civil Engineers.

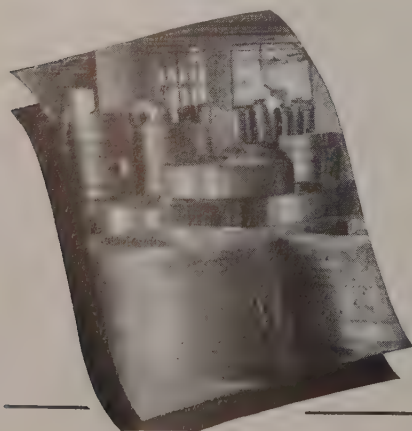


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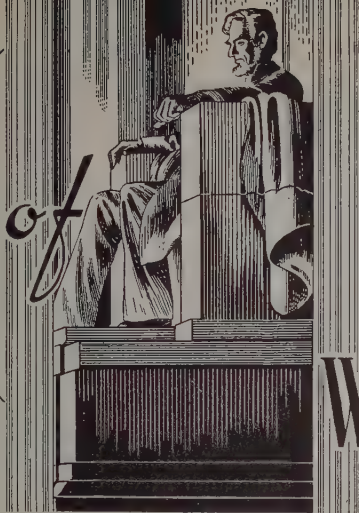
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# Windows of WASHINGTON



**L. M. LAMM**  
 Washington Editor, STEEL

**WASHINGTON**  
 STEEL'S part in national deliberations was an outstanding feature of the twenty-seventh annual meeting of the United States Steel Institute of Commerce held here last week. Industrialists and business men discussed the problem with government officials and other government officials at regular sessions and in informal group discussions. The meeting was opened by resolution reaffirming opposition to war. It recommended the temporary suspension of the economic committee change and devote its attention to the study of laws in aspects in which they are approved; recommendations to the national labor act; recommended reduction of wages and hours law; federal licensing of work; reduction in public works and thorough revision of tax laws.

War mobilization means putting the country to work on a co-ordinated basis to produce the country really needs, said Colonel Burns, executive officer of the War Relocation Authority, secretary of war, convention.

## Trade-in Bill Passed

Colonel Burns described various proposals for both the army and navy war preparations. He said the surveys soon developed it was necessary to provide for products but also concerns of raw materials. The committee had to be made of the tool and the steel problem "of certain materials and especially those obtained in large part from foreign countries."

The committee resulted in a special committee and plan. It has been able to buy some steel to correct the worst and hopes to be able to increase quantities, said Colonel Burns.

The house and senate last

week passed the bill authorizing the secretary of war to exchange obsolete machines and tools used for manufacturing ordnance for new machines and tools.

Colonel Burns continued: "There is also a special steel plan. The President recently appointed a national defense power committee to survey this field and make necessary recommendations. There are plans for critical and strategic materials."

## Cites Manganese Need

Raw materials must be readily available to permit the industrial organizations to produce war requirements as well as civilian requirements, Col. Walter C. Cole, E. A. Pierce Co., Detroit, said in discussing strategic war materials.

"Steel," he said, "is the most essential material required in modern war. During 1937 this country produced 51,000,000 tons of steel. . . ."

"Ferro-grade manganese is required in the manufacture of steel at the rate of 14 pounds of manganese for every ton of steel. Its purpose is to take the air bubbles and blow holes out of steel."

"If our steel production were stepped up to 60,000,000 tons, we should require 800,000 tons of 50 per cent manganese. This requirement makes manganese a strategic material for war and an important material during peace time."

"Of the 994,433 long tons of manganese imported in 1937, Russia furnished 383,951 long tons; the Gold Coast, 254,548; Cuba 122,937; Brazil, 77,988; British India, 70,380 tons."

"Now with our domestic production of ferro-grade manganese only 2 per cent of our requirements, we would have within our borders when war was declared only the stocks of imported manganese held in bond or in the stocks of our steel companies which would be insufficient to provide for our war requirements for more than a few months."

"In the event of a war emer-

gency, the importations from some of our sources of supply might be cut off due to the desire on the part of some of the countries to embarrass our war effort. Some of our present sources might be required by our allies. And, too, we might find that the sea lanes of one ocean are closed to us. Or we might have to abandon certain sea lanes that would require too large a percentage of our fleet for its protection and for convoy purposes."

"Assuming that our markets in Russia, India and the Gold Coast were closed to us for one reason or another, we would then have to rely upon the expansion of our domestic production and the sources in Brazil and Cuba."

"These three sources, under the most favorable circumstances, would provide less than 50 per cent of our manganese requirements for at least several years."

## Suggests Recovery Steps

"A situation of this kind might be disastrous to us particularly if, translated into terms of material and munitions, we could meet only 50 per cent of our war requirements for ordnance, trucks, tractors, motor cars, ships and other articles requiring steel and steel products. A similar situation exists in rubber and tin in which we are entirely deficient."

Free flow of capital into old and new enterprises is necessary to achieve business recovery, George H. Davis, president of the national chamber, told the convention.

"We have had enough experience," he said, "to indicate at least some of the things that are holding back investment, and, accordingly, some of the things that may be done to correct the situation."

President Davis suggested the following steps:

"Remove tax deterrents which discourage investment in both established and new enterprises; abandon

unwise public spending policies; modify laws relating to the issuing and marketing of private securities; discontinue government competition with private enterprise; abandon monetary manipulation and modify the policy of artificially cheap money; modify banking laws to permit greater freedom of private initiative in underwriting security issues; discontinue unnecessary investigations which create apprehension and impose needless burdens upon industry and trade."

James A. Farrell, former president, United States Steel Corp., and chairman, National Foreign Council Inc., discussed the export situation and called attention to the fact that one of the world's greatest trade problems is the nationalization of foreign trade by the totalitarian countries.

"The rigid government control of all industrial and foreign commercial activities of these nations has changed fundamentally the technique of the American salesman. How long this system will last and what effects it will have ultimately upon our export trade, are riddles which no one at present can solve. It is a subject, however, for serious consideration and there are present men of experience and long vision who may help this conference to form conclusions which may guide those confronted with this change in international trade."

Sweeping amendments to the Wagner act and abolition of the present national labor relations board was urged by Senator Edward R. Burke, Nebraska, in a speech explaining present efforts in congress to amend that law.

#### **SAY RECOVERY COULD BE SPEEDED BY TAX REVISION**

Lower tax rates would so stimulate business that there would be no loss in total tax revenue, said the National Association of Manufacturers last week.

Association contends a five-year net loss carry-over should be allowed to corporations in the determination of their taxable net income, and that the combined capital stock and excess profits tax should be repealed.

Privilege of filing consolidated returns, said the association, should be allowed corporations in the same manner as under the federal law in its administration from 1917 to 1934. Also, intercorporate dividends should be relieved from taxation. The association is also of the opinion that all capital gains and losses of corporations should be treated as ordinary income for the purpose of taxation.

Sating that business recovery would be definitely promoted by specific tax revisions, the association

also urged curtailed government spending.

"Definite encouragement would be provided to business confidence if government economy were practiced on a sufficient scale to indicate that definite steps were under way for balancing of the federal budget in the relatively near future.

"The ordinary expenditures of government could be reduced by at least 20 per cent," the statement continued and noted that "the secretary of the treasury is on record as believing feasible economies which would total \$700,000,000."

#### **REPORT TAX REVISION PROGRAM DRAFTED**

Secretary of Treasury Morgenthau will discuss the tax situation with the house ways and means committee during the week of May 8.

Tax-minded house members last week heard a program has been drafted by treasury department experts to eliminate taxes deterrent to better business. The legislators contend their information is to the effect the treasury department is working along the lines of elimination of the present undistributed profits, capital stock, and excess profits taxes, and also the substitution of a flat-rate corporation income levy of not more than 22 per cent.

Program also provides for the reduction in higher-bracket personal income taxes from a maximum of 75 to 60 per cent. Authorization for corporations to carry over tax credits for losses for three years instead of one is also understood to be contemplated, as is modification of the capital gains tax to encourage investment.

#### **ARNOLD EXPLAINS VIEWS ON ANTITRUST ENFORCEMENT**

Enforcement of antitrust laws is a problem of continuous direction of economic traffic and not a mere destructive agency, Assistant Attorney General Thurman W. Arnold told 200 American Trade Association Executives, meeting here last week.

"Competition," he said, "is a kind of game which requires a referee. However, the economic necessities of a machine age require that we recognize three principles in the application of the law."

He pointed out that combinations which actually contribute to the efficiency of mass production should not be destroyed; that concerted action on the part of groups of competitors in order to insure orderly marketing conditions should not be considered unreasonable and that where competition has been destroyed mere imposition of penal-

ties does not recreate the dislocation in great industry to be avoided, he said.

Association of Manufacturers Chilled Car Wheels won an honorable mention in the trade association exhibition work during the past award for the outstanding association for the year by Portland Cement association.

#### **WARNS TRADE ASSOCIATION TO RETURN QUESTIONNAIRES**

Richard C. Patterson, assistant secretary of commerce, warned some 250 trade associations who have not returned questionnaires sent to them in 1938, requesting information for temporary national economic committee.

Questionnaires were sent to associations and approximately 100 have failed to send in theirs. Patterson has asked for return of these questionnaires.

"In the case of those which are unwilling to return," says Patterson, "we will not make the appropriation to develop oral testimony the government sought in our schedule of other pertinent data." He threatened Mr. Patterson's department has received inquiries regarding the names of associations which have failed to operate, and he said, "We date steadfastly refused to make these names available. We shall not be able to list of names confidentially." 15."

#### **GOVERNMENT IRON AWARDS TOTAL \$234,000**

During the week ended May 4 the government purchased 1014.18 worth of iron and steel products under the Walsh-Healey contract. The purchases follow: Westinghouse Electric Mfg. Co., Washington, D.C., \$100,000; United States Pipe & Foundry Co., Kansas City, Mo., \$68,000; Inland Steel Co. Inc., Richmond, Ind., \$12,319.58; Carnegie-Illinois Steel Corp., Pittsburgh, Pa., \$12,319.58; Bethlehem Steel Co., Bethlehem, Pa., \$12,319.58 (estimated).

#### **SENATE PASSES STREAM POLLUTION MEASURE**

Senate last week passed a stream pollution bill and a \$700,000 appropriation for stream pollution control studies.

House passed H. R. 58, for the protection and preservation of domestic sources of water.

Senator Bailey introduced in the senate to establish a commission of an undersecretary of commerce.



# ATION

## HOW AS EXPANSION SETS UNDER WAY

for expanding the na-  
defenses now are being  
to orders. With \$66,  
ded by the war depart-  
supply bill, air corps already  
ital awards in its pro-  
532 new planes. Last  
resident requested con-  
appropriate the additional  
which the air expansion  
thorizes for fighting

for 448 warplanes went  
airplane division of Cur-  
Corp., Buffalo, 400 pur-  
\$398; Consolidated Air-  
San Diego; 8 bombers,  
Lockheed Aircraft Corp.,  
Alif, 13 interceptor pur-  
\$1,028; Bell Aircraft Corp.,  
pursuit, \$1,073,445; and  
Aircraft Corp., Wichita,  
photographic craft, \$528,-

announced are awards  
k-bombers costing about  
and other related orders  
propellers and spare

also has scheduled sub-  
ases in its air force.  
appropriation bill, now  
the house, carries funds  
es.

orders booked last  
the army, Pratt & Whit-

ney division of United Aircraft  
Corp., East Hartford, Conn., engine  
parts and tools, \$200,000; and navy,  
Hamilton Standard Propellers divi-  
sion of United, East Hartford,  
Conn., propellers, \$89,746; Wright  
Aeronautical Corp., Paterson, N. J.,  
engine parts, \$46,769; Breeze Cor-  
porations Inc., Newark, N. J., cart-  
ridge starters, \$10,917.

With their orders steadily mount-  
ing, major aircraft builders are  
speeding up production. Aggregate  
backlog for the industry now is  
estimated at \$230,000,000, highest  
level in history. This compares with  
\$150,000,000 a year ago.

### Allison To Enlarge Plant

Allison Engineering division of  
General Motors, to supply some  
600 liquid-cooled, 12-cylinder in-line  
engines for the ships just ordered,  
will enlarge its Indianapolis factory  
at cost of nearly \$6,000,000. The  
present 100,000-square foot plant is  
to be tripled in size.

Chandler-Evans Corp., Detroit,  
manufacturer of aircraft carbure-  
tors and fuel pumps, has awarded  
contract to Austin Co. for construct-  
ing at Meriden, Conn., a 102 x 143-  
foot plant costing \$55,000.

Continental Motors Corp. within  
the next 60 days will transfer pro-  
duction operations of its aircraft  
division from Detroit to Muskegon,  
Mich., according to W. R. Angell,  
president. Company is the leading  
maker of low-powered plane engines.

Agreement has been concluded be-

tween Porterfield Aircraft Co.,  
Kansas City, Mo., and Canadian  
Car & Foundry Co., Montreal,  
whereby the latter is to sell Porter-  
field's 14 commercial and private  
models in Central and South  
America. Canadian Car has con-  
tracted for 50 planes the first year.

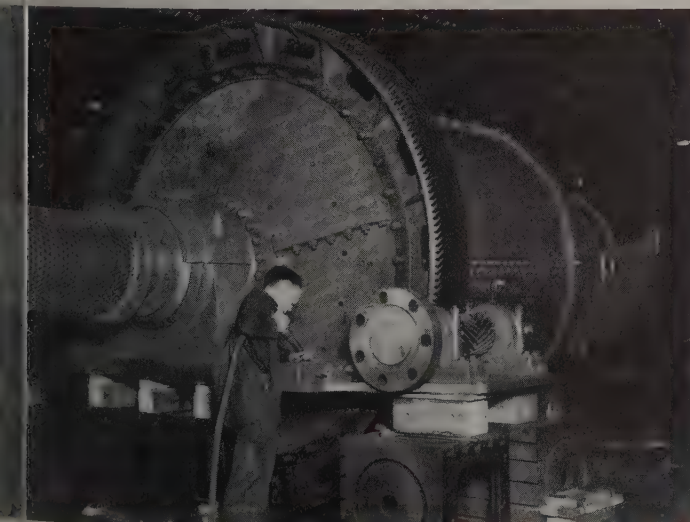
Now on drafting boards at the  
National Advisory Committee for  
Aeronautics' Langley field, Va.,  
research laboratories, are plans for  
a 100-ton amphibian, carrying 100  
passengers and crew of 10. Accord-  
ing to the superplane's developer,  
Major Carl F. Greene, army asso-  
ciate of NACA, it is intended for  
use in the near future. Craft will  
have 250-foot wingspread, be prop-  
elled by four 2000-horsepower  
pusher engines.

## New Streamlined Trains Of Aluminum Alloys

■ Two streamlined trains ordered  
by Missouri Pacific from American  
Car & Foundry Co., for construc-  
tion at its St. Charles, Mo., shops  
will be built largely of aluminum  
alloys, bringing the total of such  
trains to 12. Superstructures and  
underframes will be of this material,  
while draft gear, bumpers,  
body bolsters, platform and castings  
will be steel.

Each train will be drawn by a  
2000-horsepower diesel-electric lo-  
comotive being built by Electro-Mo-  
tive Corp., La Grange, Ill. Capable  
of traveling 90 miles per hour, and  
scheduled for a 60-mile average,  
they will be operated between St.  
Louis, Kansas City, Mo., and Omaha,  
Nebr.

## 2½-Ton Machine Shipped by Airplane



51,000 pounds, this mill for grinding gold-bearing ore recently was  
Allis-Chalmers Mfg. Co. from Milwaukee to a gold mine in Nicara-  
to be designed in sections so it could be flown from the port of entry  
Sections were limited to 3½ x 4½ x 14 feet, with weights under 4200  
as possible, and never exceeding 5000 pounds. Assembled, continuous-  
herring-bone driving gear is more than 11 feet in diameter

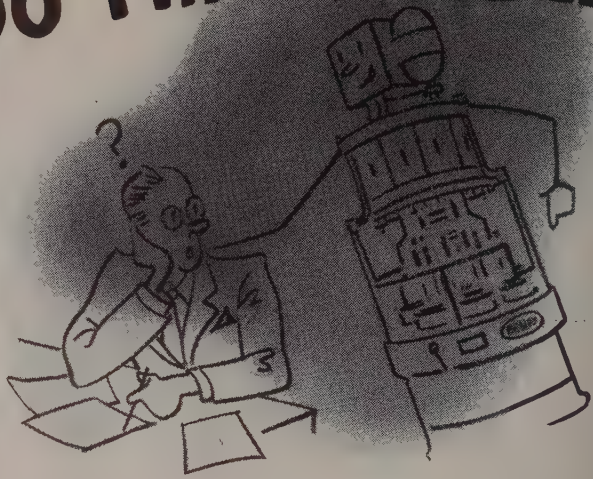
## Half Skyscraper's Steel In Resale Condition

■ Half the iron and steel salvaged  
from the Capitol building, former-  
ly Masonic Temple, Chicago, whose  
wrecking began last week, is esti-  
mated to be satisfactory for resale  
after 47 years' service. Erected in  
1892, one of the first all-steel skele-  
ton frame buildings in the world,  
its 22 stories made it the tallest  
office building until 1910.

Clonick Steel Co., Chicago, suc-  
cessful bidder for metal salvage,  
states total tonnage of steel and iron  
will be the largest ever recovered  
from a wrecked building.

Aside from the structural frame  
the Clonick company will remove  
many carloads of radiators, pipe,  
machinery, engines, boilers, non-  
ferrous metals and other material.  
Hydraulic elevators installed when  
the structure was built are still in  
service. Wrecking is in charge of  
Speedway Excavating & Crane Ser-  
vice, Chicago.

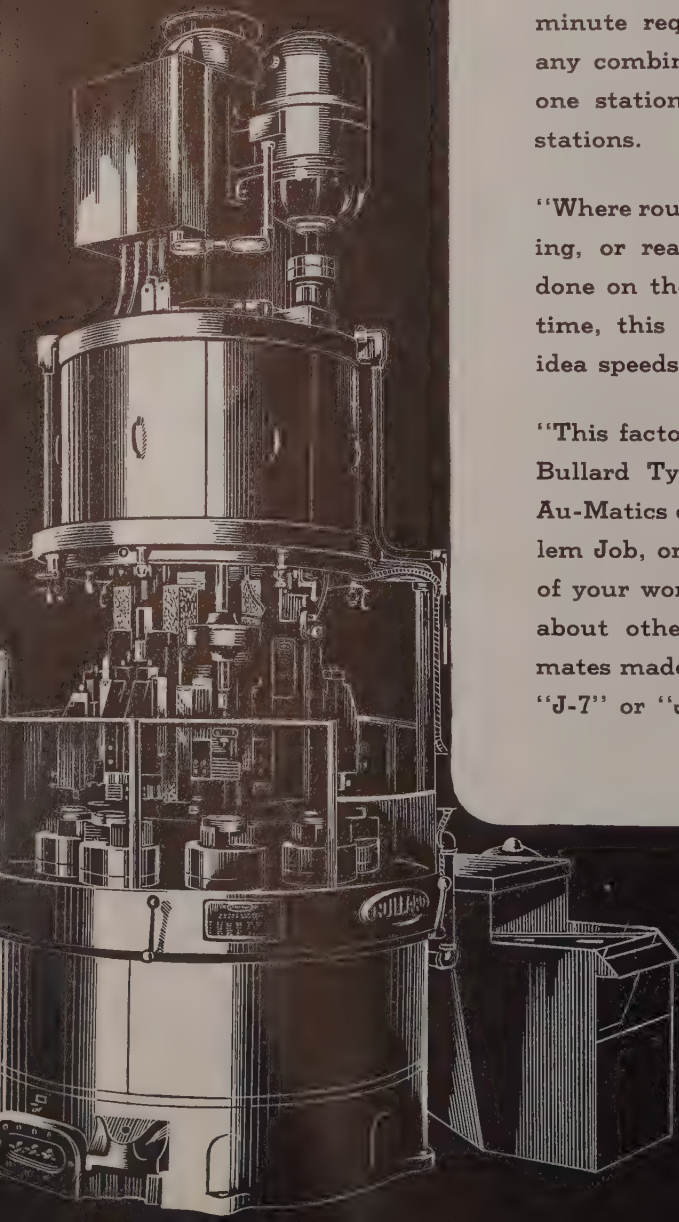
LET ME DO THAT PROBLEM.



"It's like this, Boss—Bullard Multi-Au-Matics provide for Individual Feeds and Speeds at each station. This naturally allows for the proper cutting feet per minute required by any operation or any combination of operations at any one station, irrespective of the other stations.

"Where roughing and finishing, threading, or reaming operations are being done on the one machine at the same time, this Individual Speed and Feed idea speeds up production no end.

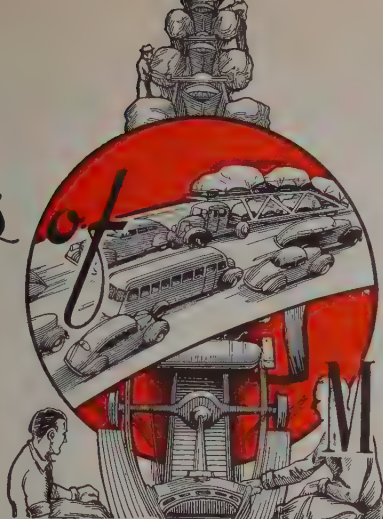
"This factor isn't the only reason that Bullard Type "J-7" or "J-11" Multi-Au-Matics can Help You on That Problem Job, or as a matter of fact on any of your work. Ask a Bullard Engineer about other facts—Ask to have Estimates made on your work as applied to "J-7" or "J-11" Multi-Au-Matics."



The  
**BULLARD COMPANY**  
BRIDGEPORT



# Mirrors of



# MOTORDOM

By A. H. ALLEN  
Detroit Editor, STEEL

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**DETROIT**  
MOBILE production in April held remarkably, week-to-week variation never exceeding 4000 out of an average 87,000 per day. This measure this reflects the which manufacturers have ang to bring more stability production cycle and also in- the failure of retail buying any sharp improvement in the season.

likely will be the high pro-  
port of the first half of the  
output totaling 389,489  
during the probable April  
more than 37,000 units.  
production got off to a dis-  
start when the first  
output dropped more than  
is behind the April weekly  
Week's production is esti-  
71,420, against 86,640 the  
year.

and four-month total for this  
407,500 which figures 55  
ahead of the same period  
and 24 per cent below the  
past. In any event the large  
urers are operating com-  
on the black side of the  
and some of the smaller  
urers — Studebaker, for  
also are putting away the  
for the time being.

## Used Car Sales

Increased sales in Plymouth,  
eSoto and Chrysler lines  
the first three months of this  
er than their usual propor-  
the entire industry—25.07  
—all Chrysler divisions  
st week in a program to  
used car turnover at the  
the spring buying season.  
poration is investing \$500-  
its dealers in this effort,  
of which will be the selec-  
he dealer of World's fair  
from his first-class used car  
and the pushing of these se-

lected cars on the basis of persuad-  
ing prospective buyers to drive to  
either of the two fairs.

Banners, pennants, extra space in  
local newspapers and special radio  
announcements will be tied in to  
stimulate sales of these selected  
cars. Emphasis will be placed on  
proper conditioning of these cars  
for coast-to-coast travel.

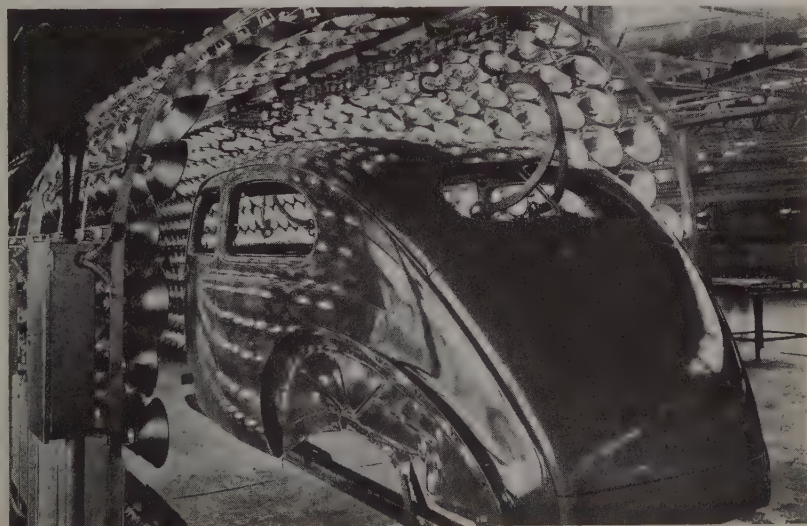
■ **CHILLY** winds whipped the can-  
vas shrouds covering five of the new  
Crosley cars in the paddock at the  
Indianapolis motor speedway on the  
morning of April 28. A crowd of  
several hundred newspapermen, dis-

tributors and guests of the Crosley  
Corp. sipped beer and shivered  
while waiting for a network radio  
broadcast of the unveiling at 11 a.m.

At the appointed hour one car was  
unwrapped and small Lewis L'Hom-  
medieu Crosley, grandson of Powel  
Crosley Jr., broke a bottle of gaso-  
line over the front end while Lowel  
Thomas, Mr. Crosley and famous  
race drivers commented over the  
microphone about the realization of  
a 30-year dream of Mr. Crosley to  
get into the automobile business.

Base price on the 925-pound car  
is \$325, f.o.b. Richmond, Ind., before  
federal and state taxes. It will show

## Gold-Plated Lamp Reflectors Speed Paint Baking



■ Fourteen thousand gold-plated heat lamp reflectors arranged in electric ovens  
bake the paint on Ford and Mercury car bodies "from inside out" at the Rouge  
plant. Primer coat is baked in 15 minutes, the infra-red rays penetrating the  
coat and heating the metal underneath. Gold plating is used because it reflects  
infra-red rays with less loss than other surfaces. Forty-five grams of 24-karat gold is  
sufficient to plate approximately 500 reflectors

a top speed of about 50 miles per hour, economy up to 60 miles on a gallon. Ten feet long and 4½ feet high, the car features a 2-cylinder horizontal opposed piston type engine, air cooled by a suction-type fan cast integrally with the flywheel. Cylinder bore is 3 inches, stroke 2½ inches, developed horsepower about 15 at 4200 r.p.m. Four passengers can be accommodated fairly comfortably.

Other technical features of the car include a single-plate clutch actuated by cable from the clutch pedal; three speeds forward and reverse Warner transmission; Spicer rear axle with full taper roller bearings; rubber mounted floating power plant driving through torque tube to rear axle, with no universal joints; four cable-controlled brakes of the Hawley type featuring a floating lining between shoes and drum and giving 350 degrees of braking; semi-elliptic front springs and one-quarter elliptic rear springs; four Delco-Lovejoy shock absorbers; 4 gallon fuel tank under hood; channel section frame of conventional design but without X-members; Ross steering gear; safety glass; and collapsible fabric top.

An interesting angle in determining the length of the car was cited by a Crosley engineer who reported that the limits of length were determined by the width of a freight car, since the autos will be packed sidewise for shipment in box cars, ten or more to the car.

■ BASED on annual production and sale of 200,000 cars, Pontiac statisticians have determined that agricultural products from an estimated 100,000 acres of land are required in the manufacturing processes. Included are 13,800,000 pounds of cotton, 100,000 bushels of corn, 500,000 gallons of molasses, 640,000 pounds of wool, 70,000 pounds of goat hair, 400,000 pounds of turpentine, 13,800,000 pounds of rubber and 22,400,000 feet of lumber.

Large quantities of other materials also are involved in producing this number of cars. For example, 270,000 tons of steel, 3300 tons of copper and brass, 200 tons of tin, 2700 tons of lead, 14,400 tons of pig iron, 500,000 gallons of spraying lacquer and 3,600,000 square feet of plate glass.

Pontiac has launched a campaign to emphasize the engineering achievements it has pioneered. The Pontiac engineering department of 217 employes averages 9.86 years per man in length of service, and its members have 94 patents to their credit. Innovations claimed by Pontiac engineers include: Cellulose car finishes; indirect lighting of instrument panels; harmonic crankshaft balancers; metered-flow en-

gine lubrication; foot-controlled headlights; integral crankshaft counterweights; clutch and brake pedals mounted on bracket attached to frame instead of engine to minimize vibration; electroplated pistons; connecting rods of uniform weight and center of gravity; gusher-valve cooling; mechanical remote-control gear shifting, and variable-rate rear springing.

Retail deliveries of Pontiacs in the second 10-day period of April reached 5065, compared with 3459 in the same interval last year and with 4326 in the second 10-day period of March. Used car sales for the period were 9988, well ahead of the volume moved last year at this time.

Automobile Production

Passenger Cars and Trucks—United States and Canada			
By Department of Commerce			
	1937	1938	1939
Jan.....	399,186	227,130	353,946
Feb.....	383,900	202,589	312,141
March.....	519,022	238,598	389,489
3 mos.....	1,302,108	668,346	1,055,576
April.....	553,231	238,133	*352,000
May.....	540,377	210,183	.....
June.....	521,153	189,399	.....
July.....	456,909	150,444	.....
Aug.....	405,072	96,936	.....
Sept.....	175,630	89,623	.....
Oct.....	337,979	215,296	.....
Nov.....	376,629	390,350	.....
Dec.....	374,349	407,016	.....
Year.....	5,016,437	2,655,777	.....

\*Estimated.

Estimated by Ward's Reports		
Week ended:	1939	1938†
April 8 .....	87,019	60,975
April 15 .....	88,050	62,021
April 22 .....	90,280	60,563
April 29 .....	86,640	50,755
May 6 .....	71,420	53,385

†Comparable week.

	Week Ended	
	May 6	April 29
General Motors .....	27,260	35,005
Chrysler .....	17,590	19,325
Ford .....	16,900	21,460
All Others .....	9,670	10,850

On April 20, dealers had a 34.2 days' stock of used cars on hand, comparing with a 43.6 days' stock a year ago.

Buick division of General Motors has announced domestic retail sales during the second 10 days of April totaling 9614 units, 61 per cent ahead of the same period of last year, and also the highest volume for this period in more than 10 years. Last week the Buick plant returned to five days production and will continue at this rate for several weeks.

L. A. Stewart, Buick purchasing agent, calculates the division buys annually more than 2200 items from a list of more than 1200 outside industries and supply companies. Among the largest purchases are raw materials, with steel heading

the list, followed by iron.

Mossers, strippers, sanders, tackoff men and guns are a few of the odd-sounding common trade classifications in occupational listings compiled by the DeSoto plant here. In language the jobs are, in building wheels with steel wheel painting, disassembling car body, painting, smoothing, sanding, dercoats of paint, overlapping, rolling together ends of sheet metal, cleaning up rustproofed surfaces before painting, and paint spray guns.

■ PACKARD last week renewed bid for a larger business in its field with prices ranging from \$1000 on the 6-cylinder, 8-cylinder and super-8 models. M. M. new president of the company announcing the reduction out that they climaxed a program involving rearranging and improvement of production facilities. He added that factory inventories currently per cent lower than last year the last few weeks Packard's production has been about 1000 per cent week, with the plant on a three-day per week basis.

Graham town car, with coachwork alone costing \$2000, recently was delivered to a buyer at a price of \$3200. Finished in English laidback style with wood door panel and window moldings of curved

Factory Wage Purchasing Power Tripled in 25

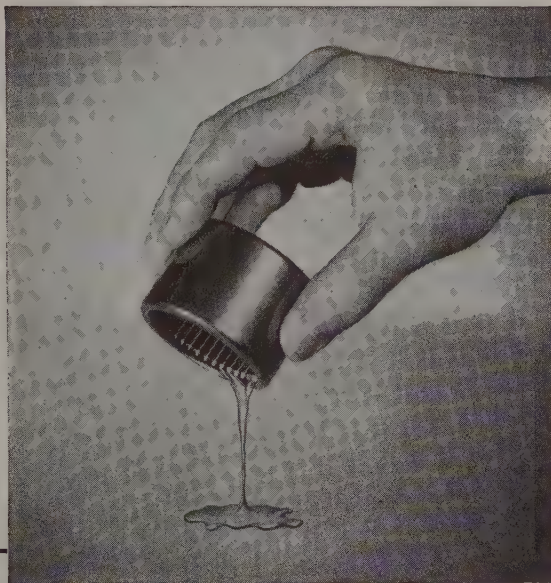
■ Lower prices and high wages have tripled the American wage purchasing power in 25 years, according to figures of the Bureau of Labor Statistics. Chicago, contained in the "Machinery and the Standard of Living."

In the past quarter century wage rates increased 70 cents an hour to 71.3 cents. 20 machine-made products declined 12 per cent. Residual average factory worker cost the 20 commodities studied 19 per cent of the effort required in 1914.

Typical examples: To make an average automobile in 1914 required earnings from 4514 to 4515 day the average car cost 4514 labor; today, only 3 hours of labor. Year's clothing for four cost 709 hours' labor in 1914, today, only 305 hours.



# CONSIDER THESE LUBRICATION ADVANTAGES of the TORRINGTON Needle Bearing



High, efficient lubrication with  
service attention is an impor-  
tance inherent in the design of  
Torrington Needle Bearing. The  
lips of its hardened retaining  
reservoir that holds plenty  
oil for long periods of opera-  
tion of the rollers constantly  
lubricant to the rotating shaft.  
The advantages of these fea-  
typical application, taken di-  
the files of our Engineering  
nt. In the knitting machine

cam roller assembly illustrated, the plain  
bushings formerly used required *daily*  
lubrication. The Torrington Needle  
Bearings now used *in the same service*  
need lubrication only *twice a year*. Note,  
too, how easily the product design was  
adapted to incorporate the Needle Bear-  
ings in place of the bushings.

## Adaptable to Varied Lubrication Requirements

The Needle Bearing is equally well  
suited for applications requiring special  
lubrication because of speed and load

conditions. The bear-  
ing can be supplied  
with an oil hole, which  
makes it readily adapt-  
able to gravity feed or  
pressure lubrication  
systems. Moreover, the  
lips of the Needle Bear-  
ing fit closely to the  
shaft, aiding in the ex-  
clusion of dirt and other

foreign matter. The Needle Bearing is  
ideally suited to high-speed operation  
at heavy radial loads, as its many  
linear inches of contact give high load  
capacity.

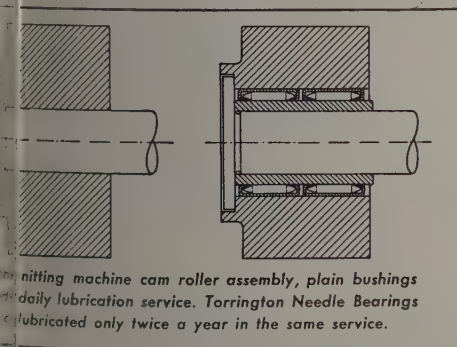
You can obtain these advantages in  
your own product at surprisingly little  
expense, because the Needle Bearing is  
low in unit cost and easy to assemble.  
The Torrington Engineering Depart-  
ment will cooperate with you in laying  
out applications utilizing the advantages  
of this unusual bearing.

For further information, write for  
Catalog No. 10. For Needle Bearings to be  
used in heavier service, request Booklet  
No. 103X from our associate, Bantam  
Bearings Corporation, South Bend, Ind.

*The Torrington Company*  
ESTABLISHED 1866  
*Torrington, Conn., U.S.A.*

Makers of Ball and Needle Bearings

Branch Offices in all Principal Cities



# TORRINGTON NEEDLE BEARING

# Steel Imports Up 38 Per Cent

■ MARCH iron and steel imports, excluding scrap, increased 38 per cent in volume over February, amounting to 24,589 gross tons valued at \$1,478,663, compared with 17,736 tons valued at \$1,236,673 in February, according to the metals

## FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons			
1939		1938	
Exports	Imports	Exports	Imports
Jan. 362,672	27,664	586,294	29,631
Feb. 359,690	19,149	460,640	19,589
March 474,360	25,369	526,883	11,827
April .....	.....	489,202	21,237
May .....	.....	540,639	20,814
June .....	.....	312,021	15,887
July .....	.....	263,699	14,728
Aug. ....	.....	242,139	20,041
Sept. ....	.....	346,068	27,958
Oct. ....	.....	425,431	26,445
Nov. ....	.....	469,596	27,627
Dec. ....	.....	490,095	28,767
Total .....	.....	5,152,707	264,551

and minerals division, department of commerce. In March, 1938, imports were 11,600 tons valued at \$989,755.

First quarter imports, except scrap, were 10 per cent greater in volume than in the same period last year, 66,656 tons valued at \$4,444,481, against 60,598 tons valued at \$4,085,398.

Structural shapes represented the largest import item in March, 3865 tons, including 3091 tons from Belgium and 715 tons from France. Pig iron receipts, six times as large as in February, totaled 3658 tons, including 2714 tons from the Netherlands, 800 tons from British India

## ORIGIN OF MARCH IMPORTS

Gross Tons			
	Iron ore	Pig iron	Manganese ore
Norway .....	27,717	.....	1,168
Sweden .....	6,255	.....	.....
Canada .....	60	144	.....
Mexico .....	179	.....	.....
Cuba .....	21,049	.....	.....
Chile .....	140,550	.....	3,239
Brazil .....	6,900	.....	.....
Netherlands .....	.....	2,714	745
British India .....	.....	800	2,862
Morocco .....	.....	.....	1
Soviet Russia .....	.....	.....	4,607
France .....	.....	.....	104
Yugoslavia .....	.....	.....	319
Gold Coast .....	.....	.....	10,134
Poland .....	.....	.....	931
Czechoslovakia .....	.....	.....	40
Total .....	202,710	3,658	20,843

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium .....	137	3,091	808	1,348
France .....	66	715	331	344
United Kingdom .....	20	59	26	173
Canada .....	1	.....	1	.....
Germany .....	.....	.....	273	.....
Sweden .....	.....	.....	143	2
Czechoslovakia .....	.....	.....	4	.....
Total .....	224	3,865	1,586	1,867

## U. S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Articles	Gross Tons		
	March 1939	Feb. 1939	Jan. thru March 1939
Pig iron .....	3,658	603	4,847
Sponge iron .....	151	266	451
Ferromanganese (1) .....	3,307	2,889	9,346
Spiegeleisen .....	2,176	2,033	5,185
Ferrochrome (2) .....	34	.....	34
Ferrosilicon .....	125	273	472
Other ferroalloys (4) .....	38	7	70
Steel ingots, blooms .....	2	.....	3
Billets .....	32	7	46
Concrete reforc. bars .....	183	162	710
Hollow bar, drill steel .....	134	63	297
Bars, solid or hollow .....	1,586	1,385	5,159
Iron slabs .....	.....	.....	.....
Iron bars .....	59	79	188
Wire rods .....	821	711	2,728
Boiler and other plate .....	2	.....	2
Sheets, skelp, saw plate .....	224	96	491
Die blocks or blanks .....	12	2	14
Tin plate, taggers' tin andterne plate .....	4	12	19
Structural shapes .....	3,865	2,412	9,811
Sashes and frames .....	.....	5	5
Sheet piling .....	.....	.....	.....
Rails and fastenings .....	212	146	599
Cast iron pipe and ftgs. ....	71	100	203
Malleable iron pipe ftgs. ....	5	15	20
Welded pipe .....	814	217	1,301
Other pipe .....	1,328	1,137	9,015
Cotton ties .....	.....	.....	2
Other hoops and bands .....	1,867	1,670	5,431
Barbed wire .....	2,065	1,654	4,731
Round iron and steel wire .....	348	282	915
Telegraph, telephone wire .....	.....	.....	1
Flat wire and steel strips .....	296	166	732
Wire rope and strand .....	126	134	500
Other wire .....	155	251	646
Nails, tacks and staples .....	779	796	2,128
Bolts, nuts and rivets .....	18	6	36
Horse and mule shoes .....	25	63	133
Castings and forgings .....	67	94	385
Total .....	24,589	17,736	66,656
Iron and steel scrap .....	780	1,413	5,526
GRAND TOTAL .....	25,369	19,149	72,182

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

and 144 tons from Canada. Ferromanganese imports totaled 3307 tons, 1168 tons from Norway, 931 from Poland and Danzig and 745 from the Netherlands. Canada supplied 2032 tons of the 2176 tons of spiegeleisen imported.

Belgium was the chief source of March imports, with 6871 tons, which included 3091 tons of structural steel and 1348 tons of hoops and bands. Germany was second with 4537 tons, including 1452 tons of barbed wire and 1182 tons of pipe.

Scrap imports totaled 780 tons, valued at \$11,927, compared with 1413 tons valued at \$22,568 in February. Canada provided 746 tons and Sweden 34 tons.

## German Machinery Sales Gain in South America

■ Germany increased metalworking machinery exports to the eight most important Latin-American markets by 30 per cent in 1938 and now ships almost twice as much as the United States, reports the machinery division, department of commerce.

Germany's 1938 sales were valued at \$4,088,294, compared with \$3,151,591 in 1937. Sales by the United States manufacturers were \$2,093,632 and \$2,297,345 in the corresponding years. Brazil, the principal South American importer of this

equipment, in 1938 purchased 101,782 worth from Germany, \$572,236 from the United States, Argentina's imports last year. Germany were valued at \$1,000,000 and from the United States \$1,000,000.

Mexico, formerly best Latin American market for American working machinery, in 1938 imported from the United States \$278,344, compared with \$278,344, compared with \$590,980 in 1937. Germany sales from \$219,916 to \$240,000. man barter agreements in 1938. Germany may replace the United States as chief source in machinery division reports.

The United States leads the world in this equipment to Mexico, Argentina, Chile and Uruguay, many has the advantage of this equipment to Mexico, Argentina, Chile and Uruguay.

## Steel's Total Tax \$98,600,000

■ THE STEEL industry's bill totaled \$98,600,000 and by nearly 18 per cent the net earnings remaining to the industry after all other expenses had been met. Iron and Steel institute reports. Earnings after all except taxes, but before depreciation amounted to \$83,727,000. After deduction of taxes to the industry was \$14,879,000, again before depreciation.

STEEL's annual financial statement (STEEL, April 10, 1939) closed 22 producers reported 92.5 per cent of ingot capacity, \$94,514,280 in taxes last year.

According to the institute total 1938 tax bill was only 10 per cent less than the \$103,000,000 in 1929, although steel production last year was less than in 1929. In 1937 the industry paid \$169,086,000 in taxes, 64 per cent more than in 1929 although in 1937 was 10 per cent below 1929 tonnage.

Steel payrolls in 1938 were approximately one-third below 1929, reflecting the 44 per cent drop in output. Because of higher security tax rates, however, total of \$28,340,000 in social taxes last year was only 10 per cent below those paid in 1929.

All steel taxes in 1938 were equivalent to a year's pay for 1,000 wage-earning employees. paid out in wages would have swelled by more than 20 per cent the industry's wage payroll. Taxes represented an outlay for each wage earner actually employed during the year.



# INGS

## MEERS ARRANGE TION PROGRAM

AN Gear Manufacturers' has completed the projects twenty-third annual at Hotel Cavalier, Virginia, Va., May 15-17. The provides for technical sessions, afternoon and evening; morning session and evening May 16; and morning May 17.

addresses on "Industrial" will be delivered at the of by H. W. Barclay, editor, and Factory, New York; and J. Jordan, Nansemond Ordnance Department, Portsmouth, Va. will be read at technical sessions. Materials for Worm Gear by C. H. Bierbaum, vice president, Lumen Bearing Co., Buffalo; "Turret Lathes in a Gear" by R. Longstreet, in charge of design for sales work, Warner & Seasey Co., Cleveland; "Modifying Room Practice," by J. M. Mins, drafting supervisor, Milwaukee; "Why the Ice Situation Within the Industry," by J. R. Fagan, treasurer, Foote Bros. Machine Corp., Chicago; and by E. S. Sawtelle, vice president and general manager, Tool

Steel Gear & Pinion Co., Cincinnati; "Application of Gear Reducers to Oil Pumping Service," by R. G. De La Mater, assistant chief engineer, Parkersburg Rig & Reel Co., Parkersburg, W. Va.; "Surface Hardening of Gear Teeth," by Dwight Van de Vate, assistant works manager, Gleason Works, Rochester, N. Y.; "Development of a Smaller Automobile Transmission," by G. L. Rothrock, rear axle and transmission engineer, Cadillac Motor division, General Motors Corp., Detroit; "Gear Metallurgy," by E. J. Wellauer, research engineer, Falk Corp., Milwaukee.

## WAREHOUSE ASSOCIATION IN CHICAGO MAY 16-17

Thirtieth annual convention of the American Steel Warehouse association will be held at the Drake hotel, Chicago, May 16-17.

A. Oram Fulton, president, Wheelock, Lovejoy & Co., Cambridge, Mass., and president of the association, will speak on values of trade associations to industries; and W. S. Dossy, executive secretary, Cleveland, will outline warehouse cost factors and market trends.

J. F. Rogers, president, Beals, McCarthy & Rogers Inc., Buffalo, chairman of the mill relations committee, will summarize progress and objectives in distribution of hot-rolled products. R. E. Desvernine, president, Crucible Steel Co. of

America, New York, will address the group.

C. M. Inman, Pratt & Inman, Worcester, Mass., is to discuss fundamentals of cutting costs; B. F. Bills, Benjamin F. Bills & Associates Inc., Chicago, will analyze sales methods of the steel warehouse industry; N. L. Deuble, Republic Steel Corp., Massillon, O., will discuss customer specifications and rejections and suggest ways to simplify steel sales processes; Charles Dickerson, Miami-Dickerson Steel Co., Dayton, O., will comment on relative merits of commercial practices and policies.

Meeting will conclude with a banquet at which Charles R. Hook, president, American Rolling Mill Co., Middletown, O., will speak.

An opportunity will be afforded to visit the following warehouses in the Chicago district: A. M. Castle & Co., General Steel Warehouse Co., Jones & Laughlin Steel Corp., Joseph T. Ryerson & Son Inc., Scully Steel Products Co., Wyckoff Drawn Steel Co., W. J. Holliday & Co., Bliss & Laughlin Inc., and Inland Steel Co.

## Republic Adds to Products in South

REPUBLIC STEEL CORP. has substantially increased the range of products at its Gulfsteel division, Gadsden, Ala.

A building, 72 x 408 feet, and bar yard, 72 x 360 feet, have been completed for a wire mesh department. The building houses two automatic welding machines, which with reels to feed the wire, and the coilers and shearers on the delivery end, are 225 feet long. The machines for producing electric welded mesh of this type were developed by Truscon Steel Co., Republic subsidiary.

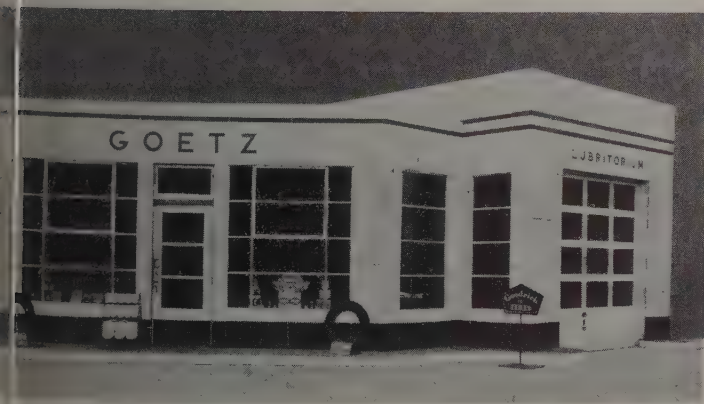
In overhauling the plate mill provision has been made for increased width of product.

Approximately 50 nut and bolt machines have been installed. The hot bolt and nut department was placed at the end of the bar mill, necessitating an extension to the building. The cold bolt department is located at the end of the wire mill. A normal range of nuts and bolts, consisting of several hundred kinds and sizes, will be produced.

Equipment has been provided for manufacturing the company's patented roofing, and drains, with capacity for several hundred tons a month. Machinery also has been added for making steel shingles.

Truscon Steel has installed complete bar bending and shearing equipment, with a warehouse for handling building products.

## Equipment Makers Enter Steel Building Field



newcomer in the pre-fabricated steel building field is Globe Steel Co., Cincinnati, pioneer in office equipment and supply company has introduced a construction that makes custom-built commercial structures from pre-fabricated standard units, quickly erected.

Wall sections are 16 inches thick by full story made of either single or double 18-gage steel. Sections

are fastened together with concealed key lock, providing a smooth wall surface. No bolts, rivets or welding are used in joining wall and roof units. Walls can be insulated with conventional materials.

Variety of interior and exterior finishes are available, porcelain enamel being stated as the most permanent. Enamel baked-on finishes are supplied in all colors.

Company already has erected several units, including the service station illustrated.

## *Safety Investments Pay Big Dividends*

■ EXPENDITURES for safety constitute one of the most profitable avenues in which money can be spent in industrial plants, a fact often lost to sight in view of the humanitarian considerations that usually are stressed when referring to safety activities. STEEL finds, upon inquiry among well-informed safety experts, that the average direct return on money spent in safety ranges from 6 to 20 per cent and that indirect savings are about four times the direct returns.

Unfortunately, accurate records of savings resulting from safety work cannot be kept, for there is no way of determining accurately the cost of accidents that do not occur. Also, it is difficult to charge accurately to safety extra costs which are entailed in designing buildings and equipment to promote safety.

But safety men do know the cost of an average accident and, by comparing the number of accidents each year with the number during the preceding year, they can tell substantially what the saving has been.

### **Intangible Indirect Accident Cost Often Many Times Direct Loss**

The cost per accident varies from industry to industry and plant to plant. Recently the National Safety Council, Chicago, reported that the cost of the average compensable injury to workers in five industrial states, including compensation, medical expenses and legal and administrative expenses, was \$273.

This figure does not include other expenses which cannot be calculated exactly but which run high. They include such intangibles as damage to plant and equipment, lowering of employe morale and loss of customer good-will through unfavorable publicity. These "hidden" costs are esti-

mated by safety experts as approximately four times the average direct cost of \$273. In some accidents the secondary costs have run as high as 400 times the primary cost.

A good example of such an extreme case is that in which an overhead crane operator was blinded by a cinder. He lost about 15 minutes in having it removed in the first-aid room and direct expense to the company was less than \$1.

But the operator had lost control of his crane and the contents of the ladle had spilled over the floor. Equipment on the floor had been ruined and the crane and the building badly damaged. Much time was lost by employes who went to view the scene. This costly accident would have been prevented had the crane operator been provided with, and worn, a \$2.50 pair of goggles.

### **Simple Precautions Are Good Insurance Against Possible Heavy Damage**

Many industrial accidents cause no compensable injuries but result in high indirect costs because of lack of simple safety precautions. Failure of a link in a chain sling in a machine tool plant recently, while causing no injuries to workmen, resulted in damage aggregating \$25,000 and brought a temporary interruption in production. This loss could have been avoided had the company followed a simple, inexpensive method, used at many plants, of inspecting chains so as to locate weakened links.

Recently Edward R. Granniss, Association of Casualty and Surety Executives, estimated (STEEL of April 17, Page 35) that the United States Steel Corp., on an investment of \$26,000,000 in safety since 1912, has profited by more than \$300,000,000.

Yes, safety is humane. But it also pays big profits. It's smart business!



# BUSINESS

# TREND

## ty Index Recedes New Low for Year

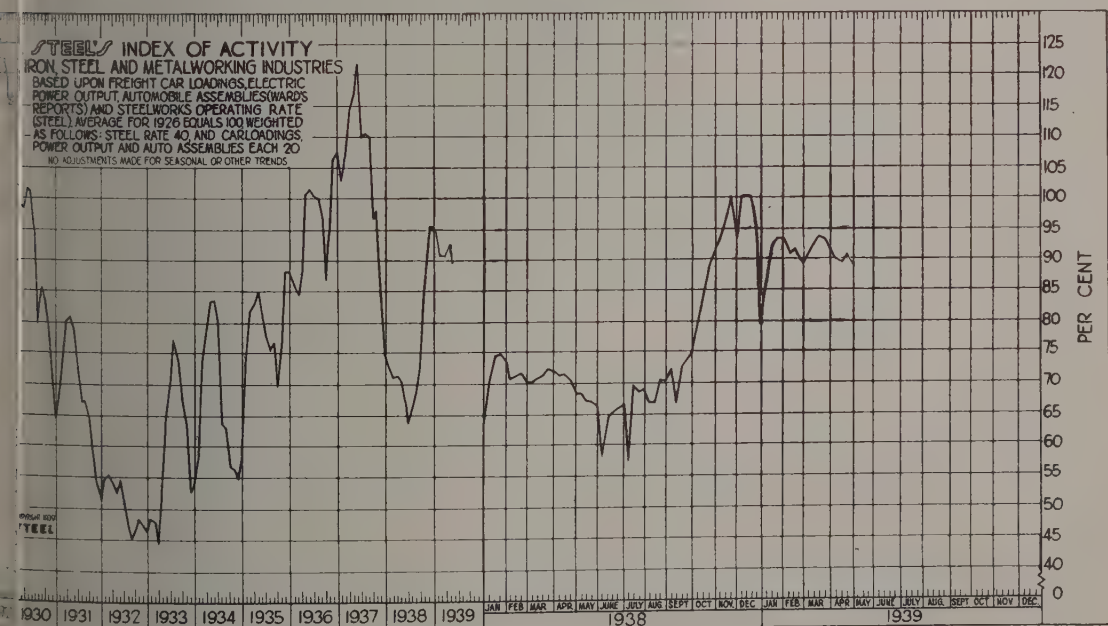
TING the downward tendency of steelmak-  
ons, electric power consumption and the  
of freight traffic throughout April, STEEL'S  
age for the month declined to 89.8. This repre-  
s of 2.8 points from the high point this  
56 recorded in March. The April average  
with 70.8 in the same month last year, but is  
below the 1938 peak of 95.9 recorded last

three of the four barometers composing  
ex in the week ended April 29 forced the

index to a new low for this year. The index now stands  
at 89.2, compared with 90.4 in the previous week and  
68.4 in the like 1938 period. The peak in the spring  
upturn this year was 93.3, recorded in the week ended  
March 18.

The national steel rate eased 1.5 points to 49.0 per  
cent in the week ended April 29. This represents the  
sixth consecutive weekly decline from the high point  
this year of 56.5 per cent recorded in the weeks ended  
March 11 and 18. However, a year ago the steel rate  
was 32 per cent—well below the current level. The  
recent downward tendency of steelworks operations is  
expected to continue through May.

Automobile production declined 3640 units to 86,640  
in the week ended April 29, thus bringing to a halt  
the upturn recorded in the three preceding weeks. Cur-  
rent indications are that output in the week ended



STEEL'S index of activity declined 1.2 points to 89.2 per cent in the week ended April 29:

1939	1938	Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
92.1	71.2	Jan.....	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
91.1	71.9	Feb.....	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
89.3	70.3	March.....	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
91.5	70.1	April.....	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
92.7	70.8	May.....	.....	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
93.3	71.3	June.....	.....	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
93.2	72.4	July.....	.....	66.2	110.4	100.1	75.3	83.7	77.1	47.1	67.3	79.9	115.2
92.2	72.0	Aug.....	.....	68.7	110.0	97.1	76.7	83.0	74.1	45.0	67.4	85.4	116.9
90.0	71.3	Sept.....	.....	68.7	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
89.7	71.4	Oct.....	.....	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
90.4	70.8	Nov.....	.....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
89.2	68.4	Dec.....	.....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

THE BUSINESS TREND—Continued

April 22 of 90,280 units represented the high mark of the 1939 model production season. Automobile assemblies was the lone business indicator composing STEEL's index not to record a decline during April. While total output for the month was slightly below the March level, daily average production exceeded that of March.

Revenue freight carloadings recorded the third consecutive weekly increase to 586,015 cars in the week ended April 29, without the aid of shipments from the soft-coal mines in the Appalachian district. The present level of freight traffic has only been exceeded by two other weeks so far this year.

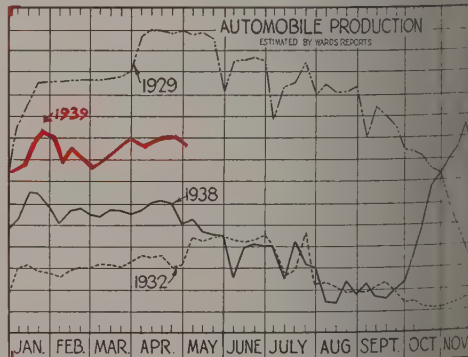
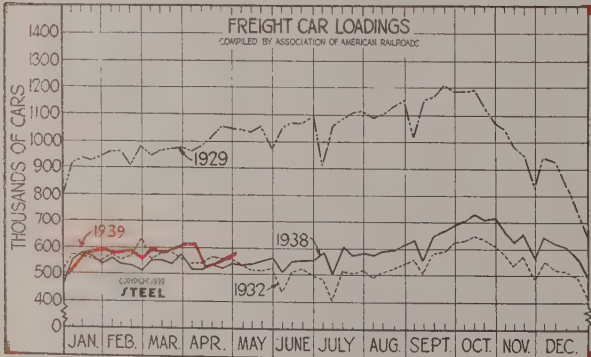
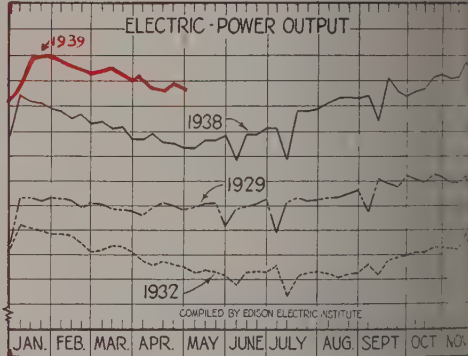
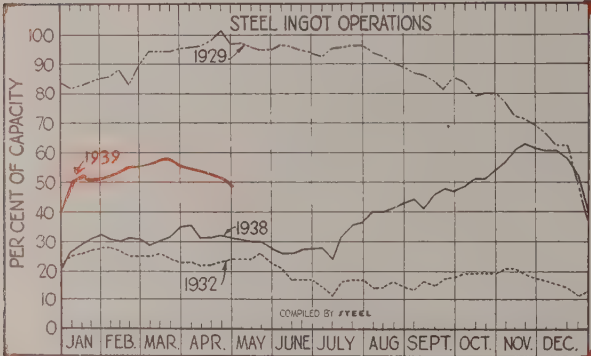
Electric power consumption of 2,182,727,000 kilowatt-hours in the week ended April 29 represents a decline from the preceding week, but remains well above the 1,938,660,000 kilowatt-hours consumed in the comparable week last year.

MARCH EXPORTS INCREASE 23 PER CENT

Reflecting an increase of 23 per cent during March, exports regained the level at which they were last December. Imports in March also recorded a substantial gain of 20 per cent, to reach the highest level of any month since December, 1937. Exports in March aggre-

gated \$268,364,000 compared with \$218,560,000 in February and only were 3 per cent below the 1938 level of \$277,948,000 for March last year. March imports totaled \$190,416,000, against \$158,035,000 in February and \$173,372,000 in March, 1938. The March export balance of \$77,948,000 was larger than the previous month's surplus of \$14,913,000. Exports remained below the export balance of \$10,000,000 in March a year ago. The export balance for the first quarter amounted to \$173,184,000, against \$173,184,000 in the first three months last year. In the first quarter of 1937 there was an import balance of \$1,000,000.

Following the general trend, exports and imports of steel and iron products in March recorded gains over the February volume. Excluding scrap, March exports totaled 162,098 tons, compared with 158,035 tons in February and 188,185 tons in March, 1938. Exports recorded the greatest increase, advancing from 224,913 tons in February to 312,262 tons in March last year scrap exports totaled 338,648 tons in March, excluding scrap, were also 162,098 tons, against 17,736 in February, more than double the 11,600 tons imported in 1938. Scrap imports during March of 780 tons a decline from the 1413 tons imported in February.



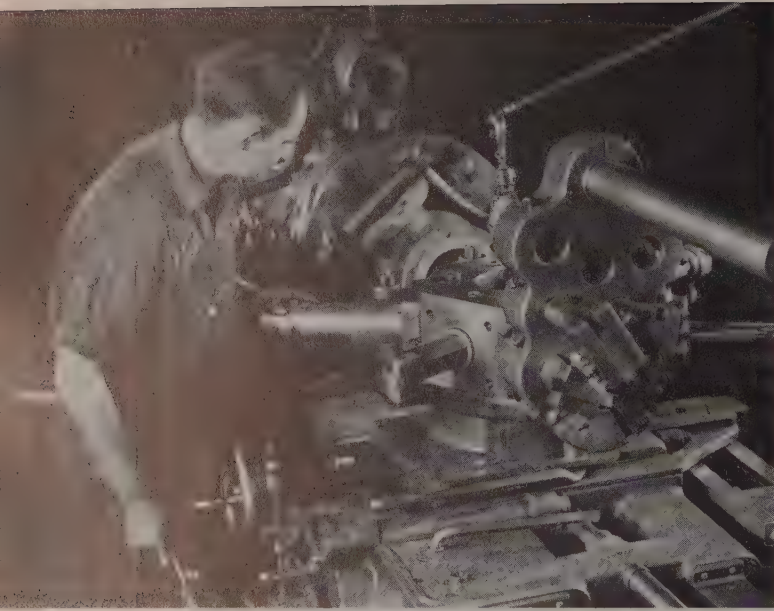
Week ending	Steelworks Operating Rate Per Cent					Electric Power Output Million KWH		Freight Car Loadings Thousands of Cars					Weekly Average Output	
	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938
Jan. 7	51.5	26.0	25.0	84.0	2,169	2,139	1,619	1,542	531	552	573	799	76,685	54,084
Jan. 14	52.0	29.0	26.0	82.0	2,269	2,115	1,602	1,734	587	580	572	914	86,925	65,735
Jan. 21	51.5	30.5	27.0	83.0	2,289	2,108	1,598	1,737	590	570	562	932	90,205	65,418
Jan. 28	51.5	33.0	28.5	84.0	2,292	2,098	1,588	1,717	594	553	560	926	89,200	59,365
Feb. 4	53.0	31.0	28.5	85.0	2,287	2,082	1,588	1,728	577	564	575	947	79,410	51,443
Feb. 11	54.0	30.0	27.0	86.0	2,268	2,052	1,578	1,726	580	543	562	956	84,500	57,810
Feb. 18	55.0	31.0	25.0	88.0	2,249	2,059	1,545	1,718	580	536	572	958	79,860	59,100
Feb. 25	55.0	30.5	25.0	83.0	2,226	2,031	1,512	1,699	561	512	636	907	75,660	56,977
Mar. 4	56.0	29.5	25.0	89.5	2,244	2,036	1,519	1,707	599	553	560	977	78,705	54,440
Mar. 11	56.5	30.0	25.5	94.5	2,238	2,015	1,538	1,703	592	557	575	946	84,095	57,438
Mar. 18	56.5	32.0	24.5	94.5	2,225	2,018	1,537	1,687	594	540	585	958	86,725	57,558
Mar. 25	55.5	35.0	23.0	94.5	2,199	1,975	1,514	1,683	605	573	561	961	89,400	56,800
Apr. 1	54.5	36.0	23.0	95.0	1,210	1,979	1,480	1,680	604	523	545	967	85,980	57,500
Apr. 8	53.5	32.0	22.0	95.5	2,173	1,990	1,465	1,663	535	522	545	956	87,019	60,975
Apr. 15	51.5	32.0	22.0	96.0	2,171	1,958	1,480	1,697	548	538	567	972	88,050	62,021
Apr. 22	50.5	32.5	23.0	98.0	2,199	1,951	1,469	1,709	559	524	562	1,004	90,280	60,563
Apr. 29	49.0	32.0	24.0	101.0	2,183	1,939	1,445	1,700	586	543	554	1,052	86,640	50,755





# Efficient

By GUY HUBBARD  
Machine Tool Editor



Machining cast iron hydrant bottom on Gisholt heavy duty turret lathe equipped with cross-feeding turret and standard tools

■ Realization has become fairly general among the more successful manufacturers that tremendous economies can be effected by the use of modern machine tools on large-scale production. It is by no means so generally appreciated, however, that efficiency and work quality can be stepped up to an equally important degree by the application of this same modern equipment to production involving relatively small lots of parts.

Machine tool builders themselves have been among the first to discover this. Much has been said of late about the swing toward special machinery on the part of machine tool users. This trend was dealt with to some length by Everard Stubbs during the spring meeting of the National Machine Tool Builders' association in Chicago. Mr. Stubbs pointed out that many machine tool parts, formerly produced in jigs and fixtures, must now be made one by one because of special characteristics involved in each case. At the same time these parts must be extremely accurate and their cost must be held within reason.

#### Machine Users Not Penalized

In getting around among the leading machine tool plants within recent weeks, I have been greatly impressed by the clever ways in which this difficult situation is being met without unduly penalizing machine tool users for their insistence that machines furnished to them must in one way or another depart from standard design.

That this situation has been met as successfully as it has is a real

tribute to the resourcefulness of the machine tool builders and to the flexibility, wide range, accuracy and ease of operation of their own manufacturing equipment. It is a tribute also to their engineers, who have made it possible to utilize so many standard parts and standard sub-assemblies in the building up of many of the special machines demanded by customers.

#### "Tool Room Machines"

Before touching upon the use of high production tools on small lot production, I would like to mention the application of what ordinarily are considered as "tool room machines", to production operations. I have in mind particularly the jig borer—usually associated with precision spacing and boring of holes in jigs.

In a plant specializing in the manufacture of multiple spindle way drilling machines to customers specifications, I recently saw one of these precision boring machines performing with great effectiveness on real manufacturing operations. These way drilling machines embody a number of large plates pierced by many holes which must be spaced and bored with great accuracy. These plates are placed in the jig borer where the holes are exactly located and spotted, then they are taken to a radial drill where the holes are quickly rough drilled. Finally they are brought back to the jig borer and the rough drilled holes are finish bored to exact size and to exact spacing.

In this way the precision machine is kept busy doing precision spac-

ing and boring, but is not idle and overloaded with work. At the same time, the layout work and "hand" is avoided—the machining this more accurately and measurably faster than the most skilled workman.

In another plant I was amazed to see precision work ordinarily associated with blocks, being attained in manufacturing conditions of heavy hardened steel form the ways of heavy lathes. In this case, a few in this country, spindle surface grinders are employed, of which there are a few in this country, of size and rigidity—in effect, a "step" in the "refinement" of a tool room idea. Some idea of the character of work turned out on this can be gained from the sectional ways for extrusion are ground separately with accuracy that no "step" could be achieved where their ends but.

When it comes to production machine tools, efficiency and accuracy of production, perhaps no modern equipment demonstrates possibilities more clearly than the turret lathe. These lathes will be considered in this connection, with the understanding, however, that as much as for several other types of machine tools—including machines; grinders; drill machines; various other lathes; planers and shapers.

#### Versatility of Turret

The adaptability of turret to what might be called "general manufacturing" has long been appreciated and taken advantage of by the builders of turret lathes for their own work, ranging from precision jobs in the tool room to the heaviest kind of



# Small Lots Increased By MODERN MACHINE TOOLS

forged and bar work

that the same advantages will apply in the plants of tool users, turret lathe have within recent years the range of speeds relative efficiency over the range in any given machine improved the "handing" set up and operation—increased the ease and speed of setting automatic stops on both cross feeds; and have micrometer dials or tool feed screws as accurate and as clearly readable as those of a precision instrument.

## Tooling Helps

As to all this, they have made available to users as wide a variety of standard tools and attachments by the use of low cost tooling which make it possible to machine and economically for complicated operations the use of special equipment.

This means to any manufacturer who must contend with small as well as with large lot production is well exemplified by the variety of parts appearing on these pages which were taken in the production of well-known manufacturer of fire hydrants, pumps and fire engines. A typical collection of parts which are required for the production of small lots, is shown in the lower right hand illustration. These parts are of steel, bronze and cast iron. In small production is not the case here, there is a con-

dition of hydrant and fire engine parts which are machined efficiently in small lots in the turret lathe. The opposite page, is shown opposite one of these parts

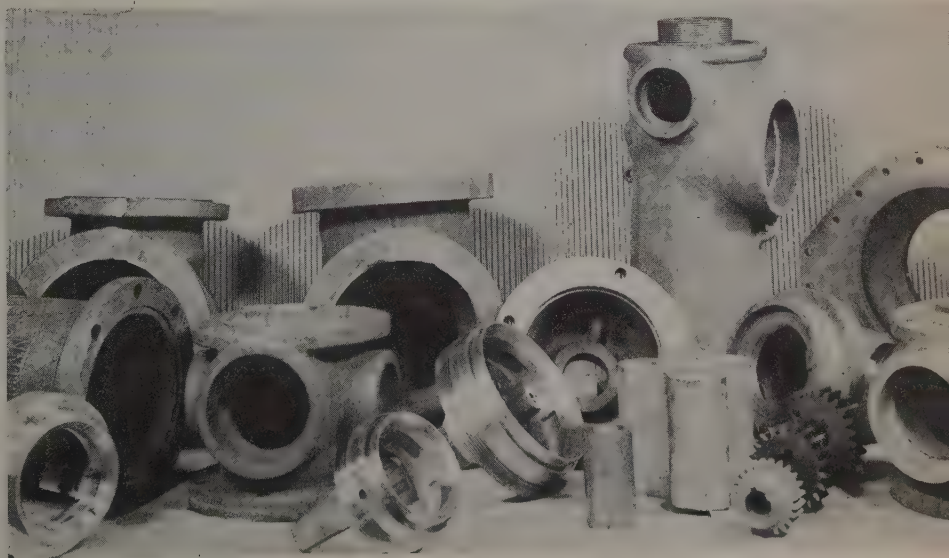
dition of seasonal demand which sometimes calls for three eight hour shifts per day. The problem was to find a rugged and accurate machine which—with the help of relatively inexpensive standard tools—could quickly be set up efficiently to handle any of this wide variety of parts—not only for short runs, but also for long runs should occasion demand.

The problem was solved by the installation of a heavy duty turret lathe equipped with a cross feeding turret which permits wide range of boring from the turret with standard single point boring bars. This machine, as depicted at the upper left, is set up for machining cast iron hydrant bottoms—the fixture on the standard chuck being designed to hold several sizes of these hydrant bottoms. On this particular set-up, standard tools are used on four turret positions; the sequence of operations being: Rough boring three diameters; finish boring three diameters; facing;

and tapping. Both cemented carbide and high speed steel cutters are used, and the time required is 40 minutes, floor to floor. Time required for machining the miscellaneous collection of parts shown, was cut on the average of 50 per cent by the installation of this particular machine.

## Consider "Small Lot" Man

It is just such performance as this which—on the occasion of the National machine tool show in 1935—inspired the president of one of the largest tool shops in this country immediately afterward to install production machinery in his precision plant. His comment to some of the machine tool builders was along this line: "You have allowed all this talk about 'high production' to obscure the fact that your latest equipment is of equally vital importance to hundreds of small lot manufacturers. I had to come out to this show and discover this all by myself."



# Open-Hearth Conference Searches For Ways to Improve Steelmaking

■ OPERATORS of open-hearth plants and blast furnace plants are working hand in hand in developing practices which will improve quality of steel and produce it more economically. This was demonstrated clearly at the national conference of the Open Hearth, and Blast Furnace and Raw Materials committees, American Institute of Mining and Metallurgical Engineers, in Cleveland, April 26-28.

As announced in STEEL last week, page 22, in a report of opening sessions, attendance at the conference set a record high point. By the last day registration totaled 580, including 512 of the open-hearth group and 78 of the blast furnace group. Next year's meeting, it was decided, will be held at the William Penn hotel, Pittsburgh, during either the second or third weeks in April.

Presenting the report on "Residual Metals in Open-Hearth Steel," J. D. Sullivan, chief chemist, Battelle Memorial institute, Columbus, O., stated that the study has been pursued for ten years and that increases in residual metals have been negligible for the most part. The analyses were made by the bureau of mines, Pittsburgh, the first three years and by Battelle institute the last seven.

Because there is little danger of residual metal content getting out of control in the near future, Mr. Sullivan announced that the study will be recessed about five years when samples again will be analyzed. This year's report showed the average, by plants, of nickel increased slightly but the average, by tonnage capacity, remained practically constant. Copper showed unexpected decrease, the average by tonnage capacity being lower than since 1932. Tin and chromium remained constant, while averages for manganese were slightly below those of 1936.

## Safety Clothing Required

In an open-hearth shop in the Pittsburgh district the first and second helper, burners, pitman, and others in dangerous occupations, are required to wear protective clothing during winter months. The men pay one-third, the company two-thirds the cost of this woolen clothing.

In an Ohio shop men on the pouring platform are required to wear impregnated duck clothing which is not as heavy as the woolen clothing, though in hot weather the men complain of skin infection and rash.

It was brought out, however, that the latter objection is remedied by having the clothing washed more often. On the other hand, a shop in the East reports that its open-hearth men are equipped with woolen clothing even in the summer months with little or no complaints.

The questionnaire on blue glasses used in the steel industry indicates a lack of standardization and a wide variety of diameters and thicknesses of glasses in service. No protection against infra-red ray is afforded. At one plant, however, the men are equipped with goggles having two shades of amber.

## Attracts Worker's Attention

A unique method for getting a safety message across to the workman is employed at one open-hearth shop. A slide is inserted in a frame at each drinking fountain so that when a workman leans over to satisfy his thirst he is obliged to read some such message as "Take a salt tablet". Or, in case an accident happens at this particular plant a photograph is taken and this is placed on the screen at the company's safety meeting with the desired result, for no man likes to see himself in an accident.

In an Ohio plant, wives of workmen have asked the plant doctor to suggest proper lunches for hot weather.

Discussing training and practical use of metallurgical observers in the open hearth, a Pittsburgh operator expressed the opinion that maximum results are obtained by having the observer work with the melter in sharing the responsibility for quality steel. At a plant in the Pittsburgh district many college graduates are employed as observers to provide a steady flow of engineers into other plant departments. This plant also trains men from their blooming and other mills as observers and it develops that as these men return to their respective departments they take with them an idea of the problems encountered in steelmaking practice which makes them more efficient in their own department.

These men are rotated from one department to another and then assigned as operations afford. They come under supervision of the plant metallurgist. Use of metallurgical observers in steelmaking practice was classed by many operators as the greatest advance made in the steel industry in the last few years.

In another plant the plan fol-

lowed is to educate the all departments of the he fully understands from ingot to finished afterwards he is made an open hearth and he f occupation for two or tr familiarize himself w tails of open-hearth n now is qualified to b and several men are him in the open-hear to record data used by gical department.

Dealing with impr working conditions in hearth department, an the Chicago district poi lockers and washroom provided for the empl as water coolers at cor tions. At another plan vices are provided in Some of the crane cab ditioned. A feature en plant is the control schedules; on many o days are scheduled to ience of workmen.

At a plant in the Pi trict, the open-hearth c come enthusiastic over rubber-tired wheelbarro inating shock, loads pounds are handled w fatigue formerly exper

A new type of open nace bottom construct scribed by Alex M. Mr intendent, construction Steel Co., Monessen, Pa. of Mr. Morton's paper STEEL for May 1, page 4

Open-hearth operators tendency to replace Au nesite with other types

## Studies Basic Lin

Discussing use of bas other special material hearth furnaces other th one operator reported a Austria using basic bric-pended furnace roof and cooled skewback as h 1000 heats before repair essary. An operator in burgh district who has basic brick in the ends expressed doubt as to th ability because of high

If coke ground to the p is mixed with a clay re mechanical means, a c fractory is obtained th resistant to slag action. fractory known as "Kla available. Carbon and after having been mixe at a high temperature, s carbon being converted i that is not absorbed by n A speaker in describing tory pointed out that th is lighter and, hence, tak



than other refractories, and slagging action and hot tops affords conductivity.

h, Continental Steel Co., Ind., speaking on "Development of Open-hearth Refractories" pointed out that this is criticized for receiving materials without submitting to tests. Many smaller plants have installed testing refractories. He stated that there is no standard procedure for testing brick for resistance to slag, this merely being represented by weight loss.

The operator expressed the opinion that maximum checkers' accuracy must be found for temperatures of 2650 degrees. He emphasized that this must be done in the open-hearth roofs that maintain a working temperature higher than present practice.

#### Operation Is Curtailed

In the last ten years, not over 15 open-hearth plants have been built in this country, according to a report of W. C. Buell, engineer, Cleveland. Many of the plants are 20 to 40 years old and the open-hearth plants in general can be rated as fine old plants.

Problems encountered in the open-hearth were discussed by Mr. Urquhart, superintendent of the open-hearth department, Carnegie Steel Corp., Munhall, Pa. at a meeting of open-hearth and blast furnace committees. Inter-plant steel quality, he said, has been improved from four different grades of pig iron: Low-silicon pig iron, in which the silicon is over a wide range in content, and high and low

carbon of pig iron preferred. The silicon is 4.25 per cent carbon, 0.200 phosphorus, 0.120 silicon, 0.025 manganese. However, iron with manganese and phosphorus 0.300 is preferred because the blast furnace-hearth slag.

The content of pig iron, so far as regular, does not offer a problem in the open-hearth process. While little attention has been paid to the less common grades of iron produced into iron by the open-hearth, Urquhart predicted that the increasing demands on iron of the resultant steel will give consideration along with the open-hearth process.

The attention devoted to the relationships in the open-hearth process, more thought must be given to the silicon content of the iron within a definite narrow

range. If silicon is high, particularly when making rimming steel, time of heats will be prolonged to build up the iron oxide content of the slag to obtain rimming action in the mold. Furthermore, the speaker contended, more uniform silicon iron affords closer control of melts in the open-hearth shop, faster time of heats and lower production cost.

Hot metal mixers are a misnomer, the speaker asserted, inasmuch as they simply are reservoirs for hot metal. No mixing occurs within this vessel according to tests. Slag bank and bottom troubles, large slag volumes, and increased iron loss are results of high-silicon iron. The speaker emphasized that uniform silicon iron therefore should be considered important by the blast furnace operator.

With the trend pointing to larger use of flat rolled products and the unfavorable influence of sulphur on surface quality, blast furnace operators will be obliged to control this element more closely. Because the steel bath absorbs sulphur from fuel, pig iron must not contain a higher per cent of sulphur than is allowed in the finished steel, or manganese will have to be used to reduce the sulphur content. Both methods, the speaker contended, are costly.

High-temperature iron is desired by open-hearth operators because it gives less trouble at the mixer. Until satisfactory temperature measuring devices are perfected, it is impossible for the steelmaker to specify what high temperature he desires.

#### Recommends Furnace Control

Mr. Urquhart recommended that process control be extended to operation of blast furnaces. He explained that by grouping and averaging a large series of casts it is possible to obtain the effect of variations in a given constituent.

Still more will be required of the steelmaker in the future as the result of rigid requirements, according to E. L. Ramsey, superintendent steel and booming mill departments, Wisconsin Steel Co., South Chicago, Ill. Because scrap is lighter and contaminated with alloys, the only means the open-hearth operator has of improving his raw materials is by way of a more uniform grade of hot metal.

The grade of iron best suited to his particular practice is 0.60 to 0.90 per cent silicon, 1.50 to 2.00 manganese, 0.200 to 0.250 phosphorus, 0.04 maximum sulphur, and minimum casting temperature of 2700 degrees Fahr.

The speaker emphasized importance of casting iron at a minimum temperature of 2700 degrees at the blast furnace and having facilities to deliver hot metal to the open

hearth not below 2450 degrees and preferably 2600 degrees Fahr. A manganese content ranging from 1.50 to 1.75 per cent in hot iron is preferred by the speaker to hold the residual manganese low enough so that ferromanganese can be added after oxidation.

If hot metal from the blast furnace is not kept in close range (20 points variation in silicon) open-hearth practice is thrown out of balance and the melter is obliged to change his practice. As a result, Mr. Ramsey stated, it is almost impossible to produce physically uniform heats.

In conclusion, the speaker stressed importance of hot metal with high temperatures, silicon most suitable for furnace operation and quality of steel being made, and uniformity of metal.

#### Affects Furnace Materials

E. H. Leathers, assistant open hearth superintendent, Wheeling Steel Corp., Steubenville, O., pointed out that when silicon in iron is too high it is hard on furnace materials around the slag line. On the other hand, when silicon content is too low, the heat is sluggish and probably will melt soft. At the speaker's plant where sheets mostly are made, best results are obtained when the iron analyzes 0.90 to 1.20 per cent silicon, 0.040 sulphur, 0.265 phosphorus and from 1.90 to 2.00 manganese.

C. J. Fleisch, assistant superintendent, Carrie blast furnaces, Carnegie-Illinois Steel Corp., Rankin, Pa., directed attention to the trend for lower sulphur in pig iron thus making it necessary for the furnace operator to carry a slag of high basicity. He contended that operators are close to the limit of control of regularity in silicon in iron. Three factors which cause the greatest variations in silicon, the speaker pointed out, are variation in coke properties, size of raw materials used in the blast furnace burden, and moisture content of the blast.

The open-hearth department will take hot metal up to 0.05 per cent sulphur occasionally, though below 0.03 per cent is preferred. Iron over 0.05 sulphur is put through the pig machine. Cold iron ranging from 0.05 to 0.07 sulphur is used by the open-hearth department in small portions. All iron over 0.07 sulphur is recharged in the blast furnace and costs the furnace operator about \$1.00 a ton for yard switching, conversion, handling, and remelting.

Results obtained with an optical pyrometer indicate that iron is tapped from normal working blast furnaces at about 2700 degrees Fahr. When slow blowing is employed, temperature of the iron usually is

(Please turn to Page 63)

## Steel Engineers' Group Visits New Seamless Tube Mill in Youngstown

■ MORE than 550 members of the Association of Iron and Steel Engineers attended the joint meeting of the Pittsburgh and Cleveland sections at the Ohio hotel, Youngstown, O., May 2. During the morning members and guests were taken to the Brier Hill works of the Youngstown Sheet & Tube Co. in buses to inspect the layout for making tube rounds. Following luncheon at the Ohio hotel, buses took the group to the new seamless tube mill at the Campbell works to observe the conversion of the rounds into seamless tubes.

The mill inspected at the Brier Hill division was rebuilt about two years ago. Blooms coming from a continuous furnace or direct from a 40-inch bloomer are converted into tube rounds by a 35-inch 2-high reversing blooming mill equipped with rolls 38 3/16 inches diameter and with a body of 84 inches. This unit produces from 100 to 135 tons of rounds an hour ranging from 5½ to 13½ inches diameter. The pieces are cut to length by a 72-inch hot saw, centered, stamped and conveyed to a chain-type cooling bed located on the outside of the building.

### Removes Surface Defects

After traveling the full length of the bed, the product is returned to the building and fed through a peeler. This machine is built with a revolving head in which six alloy steel cutters are mounted. As the rounds pass through the unit the surface defects are removed thus obviating the pickling operation. The rounds then pass over the inspection and conditioning beds and are shipped to the new seamless mill at the Campbell works.

At the dinner in the evening music was furnished by a 15-piece orchestra of the Youngstown Sheet & Tube Co. and later its glee club consisting of 80 voices rendered many vocal selections. Members of both groups are company employees of long standing.

At the technical session following the dinner, C. G. Ohlson, vice president and general manager, Aetna-Standard Engineering Co., Youngstown, O., reviewed the developments in seamless tube manufacture. The cupping process patented by Redmond in 1851, he stated, is still in use principally for sizes 5 inches and larger in comparatively short lengths such as required for gas cylinders and couplings.

In 1885 tube manufacture received

its real impetus by the invention of the Mannesmann method of producing seamless tubes by piercing a solid round between oblique rolls.

Before 1896 seamless tubes had been produced in this country by cold drawing from imported pierced billets or by the cupping process. In that year, however, R. C. Stiefel designed and installed a mill at Ellwood City, Pa., for producing tubes up to 2½ inches in diameter. Today mills of this type having double piercers are making tubes 16 inches outside diameter, and with expanding machines, up to 24 and even 28 inches diameter.

Mr. Ohlson in discussing the Pilger mill mentioned that about 15 years ago a mill of this type was installed at the Campbell works of the Youngstown Sheet & Tube Co., Youngstown, O., to manufacture tubes up to 13% inches outside diameter and from 60 to 80 feet long.

It was found, however, that the operating equipment of a Pilger mill such as mandrels and rolls, is expensive from the standpoint of first cost as well as maintenance. Because of this fact as well as the inconvenience of making the bottom poured round ingots the original German piercing mill and the two Pilger stands of rolls were replaced by two high-speed piercing mills. This change was made during February, 1938, and represents the latest and most powerful installations of its kind in the United States, the speaker pointed out.

The mills, which have a rated annual capacity of 300,000 tons, handle billet lengths from 7½ to 11 feet. Should billets shorter than 7½ feet be required, they can be heated in double lengths and divided by a gas cutting machine located in the furnace runout table, Mr. Ohlson explained.

## Speed of Mills Differ

The piercing rolls are 51 inches maximum diameter having barrel length of 30 inches. The two piercing mills are identical except for their speed and direction of rotation. No. 1 piercer runs at 71½ revolutions per minute and number two at 77 revolutions per minute, giving surface speeds of 955 and 1030 feet per minute, respectively, with maximum roll diameters. Rolls in the No. 1 piercer run counter clockwise and in the No. 2 stand clockwise when looking into the mill from the entry side. Obliquity of rolls can be adjusted up to 12 degrees. Each mill is

driven by a 5000-horsepower synchronous motor.

The plug mill has rolls 36 in. in diameter and 56 inches long. It is direct driven by a 2000-hp, 1800-rpm synchronous motor. The rolls are of the barrel type, 36 in. in diameter by 28-inch wide, having a fixed obliquity of 1.5°. The sizing mill is designed to have five pairs of rolls 32 inches in diameter and 21 inches long, rotating at a speed of 21 revolutions per minute.

In his closing remarks, the speaker emphasized that great progress has been made during the last 10 years in the manufacture of welded tubes by the Mannesmann process, but he also warned that much more remains to be done in order to meet the more exacting specifications, particularly with respect to dimensional tolerances, which likely are to appear in the near future. To solve this difficult problem, the speaker suggested that the solution lies in the combination of methods used in the past by an entirely new process. The speaker's question in the speaker's

S. M. Weckstein, chief Timken Roller Bearing Co., in speaking on "The Art of Antifriction Bearings Mill Equipment," reviewed the various methods employed in the production of both seamless and welded tubes. The speaker pointed out the use of tapered bearings in modern tube mill equipment.

## Bearings Left Inta

In discussing the plug  
ess the speaker pointed  
bearings are not removed  
the roll necks except with  
iameter of the roll has been  
to a minimum dimension.  
periodic dressing of the  
entire assembly is mounted  
lathe, the speaker explained  
coupling is chucked in  
of the lathe and the roll  
in that way. To support  
end, a center plug is fitted  
shaft and rolls supported  
tailstock center. The end  
rolls are supported in a  
bearing on the steady rest.

The speaker referred to application of taper rollers to the main rolls of a plant in 1927 at the plant of the Roller Bearing Co. During the year's operation, he asserted, saving was made and a remarkable improvement in concentricity of the tubes. Mr. Weckstein gave the results of operations in the production of tubing by the Diescher, welded processes, analyzed the requirements and recommended bearing application in the positions of the mills involved.





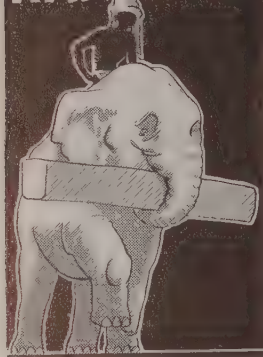
# BUILT BY **E** MORGAN *Engineering*

## 35" BLOOMER - ONE OF MORGAN'S NEWEST

many types of mill  
It by Morgan is the  
high blooming mill  
double manipulator.  
tables, recently in-  
prominent mid-west  
similar 35" mill and  
now under construc-  
shops for another  
mid-west producer.

Housings are one-piece steel cast-  
ings of the closed top type. Top  
roll balance is of the counter-  
weight type. Manipulator is of the  
overhead type, compact and acces-  
sible. Tables are of heavy design,  
equipped with anti-friction bear-  
ings. Provision is made for auto-  
matic lubrication and exclusion of  
scale and dirt.

- ★ **DESIGNERS • MANUFACTURERS • CONTRACTORS**
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## Barrels and Drums

Complete mechanization of barrel and drum making involves several specialized pieces of handling equipment. Processing and handling are combined in drum painting and baking setups to increase efficiency and to utilize floor area more effectively

By HARRY C. ORR

The C. O. Bartlett & Snow Co.  
Cleveland

■ IN THE manufacture of steel barrels and drums, a considerable amount of special handling equipment has been developed contributing materially to efficient and low cost production. In many instances, such handling equipment has been successfully combined with processing machines.

In general, the equipment involved can be divided into three main groups: The first handles steel sheets, formed sheets, formed shells and heads, to and from the various fabricating machines; the second is for finishing operations such as those required in cleaning, predrying, painting or lacquering, and the baking; the third group takes finished drums to storage or loading platforms.

For fabricating operations, special conveyors may advantageously be used to carry formed sheets from the rolls to the welding machines, and welded shells to the flanging machines, both conveyors usually being of the double chain type, but arranged to carry formed sheets longitudinally and welded shells transversely. Also, separate conveyors may be used for transferring the fabricated drums from the testing equipment to the predrying conveyor, although this usually is accomplished through an extension to the foot of the predrying conveyor. Some installations made recently have variations from the above equipment, which include washing and drying machinery; but there is noticeably a general trend toward

combining handling and processing equipment to obtain a more compact plant and more efficient operation.

The second series of handling operations—through finishing processes—has been almost completely mechanized in many plants. The installation at St. Louis Steel Package Co., division of Niedringhaus, Inc., St. Louis, is an excellent example of a completely mechanized barrel plant. Illustrated in accompanying views are the processing and handling systems which predry the fabricated barrel or drum and bake on the paint or lacquer which is applied by an operator with a spray gun. At this plant, fabricating operations are handled on the first floor and painting, baking and storage on the second floor. Fabricating operations progress from shearing, through forming and welding to produce a cylinder, and on to where hoops are formed in shell, and ends are double seamed in place. A testing station also is located on the first floor.

Drums fed into the predryer on the second floor have just come from the testing station, where they have been immersed in water and air pressure has been applied to check tightness of all seams. They are wet, and so must be dried and

preheated before painting. Results are to be obtained by dryer unit rolls drums horizontal, insulated enclosure in the elevation diagram. Cross rods mounted between strands of conveyor chain roll the drums through dryer. This spreads the water over the surface, makes for more rapid drying.

### Predryer uses Exhaust

Usually, about 10 min. predryer is sufficient to obtain satisfactory results without taint from gases exhausted from the paint drying oven. In type drying oven, the predryer can be located conveniently beneath. Thus, all equipment, line, and the drums can be charged from the predryer, painted, and charged directly into the drying oven conveyor without effort and with equipment arranged compactly as shown in elevation diagram, Fig. 1. This is a side view of the predrying oven equipment used at St. Louis Steel Package Co.

Fig. 2 shows a workman loading drums into the predrying unit. Cross rods which roll the drums

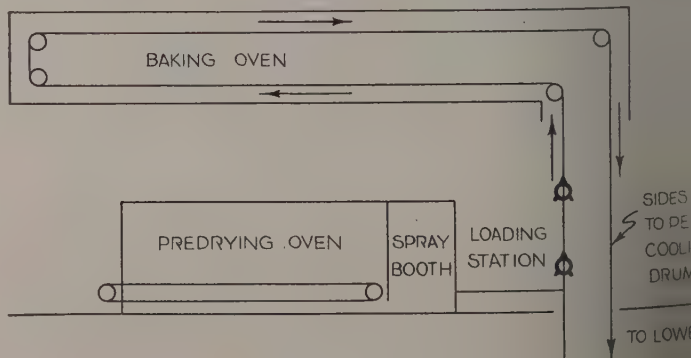


Fig. 1—Side view diagram of oven arrangement with conveyor drives





# *Without Steel We'd Have To* **BRING AMERICA BACK TO THE INDIANS**

up to realize how utterly your comfort, life itself depend upon steel? When sleep, walk, ride, telephone or telegraphing steel.

Without steel there would be no newspaper, no heated homes, no modern office buildings; no electric light, no gas, and as for national defense -- steel is the bulwark of the nation.

Everything you use and enjoy depends directly or indirectly on steel. Because of

improvements made in steel in recent years thousands of products are of better grade, and cost less -- and hundreds of new products are possible. The steel industry knows how important it is to employment and prosperity to maintain constant improvement in steel and manufacture. That is why Youngstown spends millions to improve its facilities and products and to help the public employ steel to better advantage.

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Manufacturers of Carbon and Alloy Steels

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25--13B



# YOUNGSTOWN

seen through the open end of the predryer. In Fig. 3, drums are being spray painted as they come from the predryer which is shown at the right.

For the painting operation, a machine is provided to support the drum on four positively driven rolls which revolve and carry the drums, usually on their chimes. Paint is sprayed onto the ends and side of the drum by one or two men, and therefore this unit becomes more or less the determining factor in establishing the capacity of the entire finishing equipment. Ordinarily, if one man is employed and only one color applied, a maximum of four drums per minute can be painted. If two or more colors are applied, this capacity is reduced.

Two men can paint up to about six drums per minute, and therefore a painting and drying installation, using one painting station, may have a maximum of 360 drums per hour. Ordinarily, fabricating equip-

ment is capable of producing about 300 drums per hour when set up for continuous operation. This also is a factor in determining the capacity of the finishing equipment.

The paint machine has rollers mechanically adjustable to suit the length of the drum. Also, manually adjustable machines are sometimes used where adjusting time is of no importance, or where large quantities of the same size drums are painted at one time.

Manually operated levers control the loading and discharging of the paint machine. However, no men, other than those engaged in painting, are required for operation of the layout from the time drums enter the predryer until they are discharged from the drying oven.

To conform to safety requirements, an enclosure is provided around the paint machine. The spray gun operators work in such a position that excess spray flows into the enclosing chamber, Fig. 3,

where the vapors are drawn into the atmosphere by means of a draft. Two powerful illuminators illuminate the inside of the booth to facilitate painting.

When painted, drums are charged into a synchronizing station which permits them to roll into place on a conveyor as the conveyors successively come to rest. This conveyor unit operates continuously to carry the drums up and through the drying oven located above the painting station, shown in Fig. 1. From the oven, drums travel down the same conveyor to unloading stations, either on the first floor, as may be desired.

Although paint drying ovens can be built in three principal types, the L-type as used at the St. Paul Package Co. plant is by far the most popular, since it conserves space by doubling back. See illustrations. Dryers of this type are in the shape of an "L," laid horizontally, the projecting leg downward, and the continuous conveyor, which carries drums through the oven, is supported by two strands of chain. The drums are spaced 36 inches apart.

#### Cooling Zone

That portion of the projecting leg below the heated horizontal section of the drying oven is left open to permit the drums to cool as they move out of the oven to unloading stations or gravity roller conveyors seen in Fig. 4.

The oven is designed to handle drums at a rate of about 300 per minute. A temperature of 250 degrees Fahr. is maintained. As drums pass through the oven, the speed which permits them to remain in the heated zone about 10 minutes. The total length of the horizontal portion of the oven shown in Fig. 1 is 100 feet. In some installations, the oven is of sufficient length to provide a cooling zone in which the drums are cooled for 5 to 10 minutes before being charged.

The oven structure is surrounded by a layer of rock wool insulation and is enclosed in sheet steel covering. It shows McCann type, natural gas air heater used at St. Paul Package Co. It employs

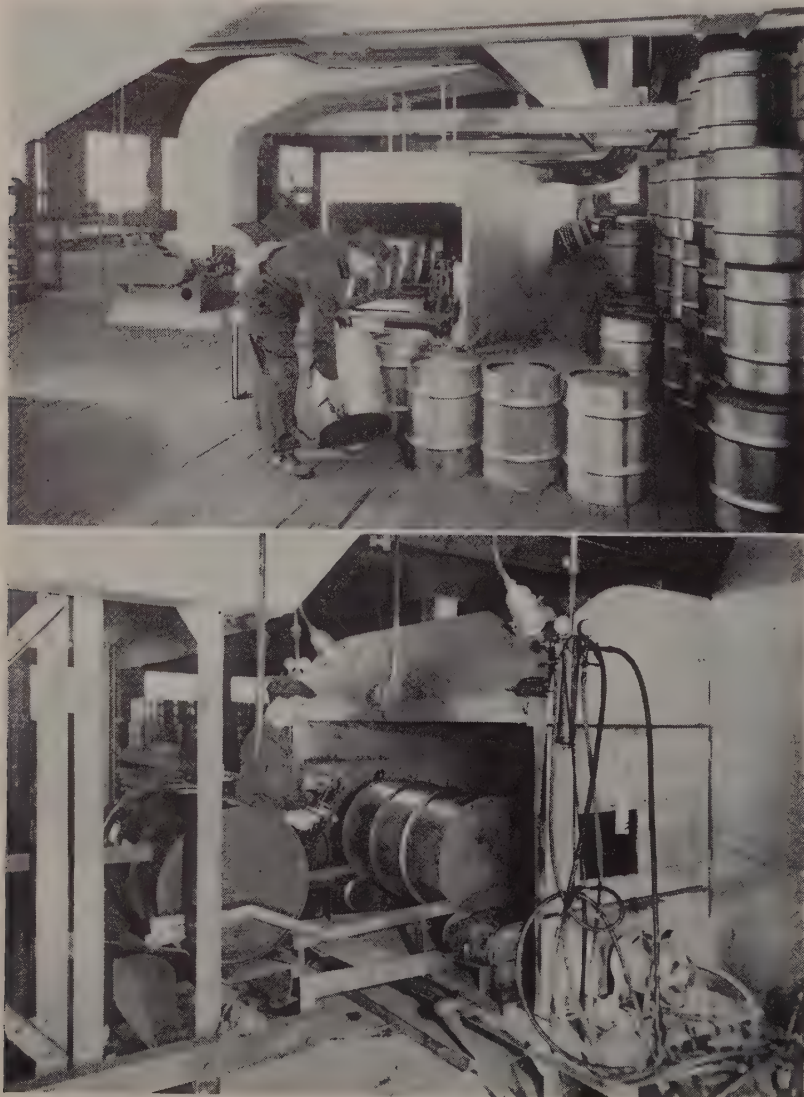


Fig. 2 (Upper)—Loading end of predryer unit. Fig. 3 (Lower)—Discharge end of predryer unit with loading station to over the oven conveyor.



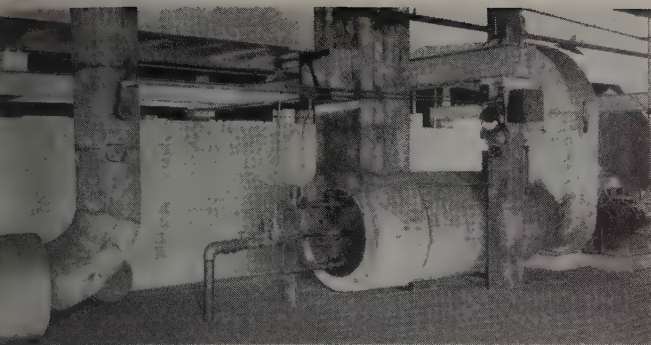


Fig. 5.—Oven heating equipment and blowers

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bustion of the fuel oc-  
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minimum amount of fuel  
back to the desired tem-  
perature is of welded steel  
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ated. Heater is equipped  
ic temperature controls  
features. Blower unit  
er can be seen in rear  
ight of Figure 5.

#### Hot Air Is Reheated

Figure 5 is the blower  
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heater unit. Remainder  
exhaust is returned  
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n temperature through-  
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lications, the drum is  
the inside with certain  
lacquers or coatings de-

pending upon the proposed contents  
of the drum and the manufacturer's  
preference. Not all lacquers and  
coatings dry under the same con-  
ditions. In those plants such as the  
one illustrated where only one oven  
is installed, lacquered drums are  
handled separately from those which  
do not require lacquering. These  
drums are painted on the outside  
after first being lacquered on the in-  
side. Between operations, drums  
are returned to fabricating machines  
for insertion of heads and placed in

storage ready for paint application.

Since most lacquers require bak-  
ing temperatures from 425 to 600  
degrees Fahr., oven temperature  
must be suitable for the particular  
lacquer at hand, also a bake of  
about 30 minutes at the proper tem-  
perature is required, and the con-  
veyor drive is slowed down to give  
this drying period. This, of course,  
cuts down the output of the oven to  
about three drums per minute.

The necessary range of drive  
speeds for the conveyor is obtained  
by the use of a Reeves variable  
speed transmission unit, seen at the  
lower left in Fig. 4. This drives the  
conveyor for the entire drying oven.  
A similar unit used on the pre-  
dryer affords the range in speeds  
required for various work there.  
Variable speed transmissions allow  
quick adjustment to permit highest  
rate of production for the particu-  
lar size, type and shape of work  
being handled. At the right in Fig.

(Please turn to Page 78)



r leg of drying oven con-  
ner floor level with tilting  
n in operation standing  
d on roller conveyor. Photo  
eves Pulley Co., Colum-  
bus, Ind.

*It's a Laugh ... In Pratt's Corner*



**FAFN**



# NECESSITY In the Bearing Business

mer J. Butts or any other  
be a "specialist in every-

d ball bearing source can

It's a quality to seek in  
g supplier — a quality to  
e plus side, if you find it.



an organization "special-  
thing"? Because it IS an

— and, if it is serving a

of diversified industries

at make up Fafnir's cus-

because it is composed

a specialist in the field

s this mean to you, a

r relying on Fafnir to

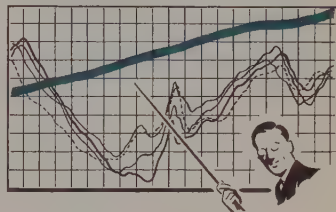
meet your ball bearing needs? It means that whether your blue-prints call for railway cars or paper mill equipment . . . machine tools or aircraft . . . blowers or spinning frames . . . or any one of a dozen other products within Industry's major classifications, you can count on Fafnir for far more than bearings alone.



Your Fafnir representative, with the advantage of years of experience in solving similar problems, will be of real help in the adaptation of ball bearings to your shafts. He will make intelligent recommendations on seals, shields, speeds, loads, preferred lubri-

cants. He will understand your needs from the service point of view.

But the value of "specializing in everything" is even broader than that.



Fafnir's diversified customer-list is your soundest assurance that neither a recession or a sudden boom in any industry will affect this company's ability to serve you promptly and dependably.

No matter what your bearing need, Fafnir has specialized in an application related to it. No matter what your service requirements, Fafnir will meet them, regardless of "business cycles" in the newest or the oldest industry. The Fafnir Bearing Company, New Britain, Connecticut.

## BALANCE IN PRODUCTION

The balance of Fafnir production between standard and specialized ball bearings results in important advantages. Because so wide a range of types and sizes are standard items in the Fafnir line, engineering and production of specialized bearings can be limited to those where a definite departure from stock material is absolutely necessary.

Yet, when required, these specialized bearings are more efficiently produced because of Fafnir's extensive experience with **all** types. That is why Fafnir engineering and production staffs are better able to handle all customers' demands for specialized applications. And that is how Fafnir brings down costs and speeds up service on specialized bearings.

# Ball Bearings

THE BALANCED LINE . . .  
MOST COMPLETE IN AMERICA



# New Melt Shop

This company's steelmaking operations were transferred to a new melt shop without seriously interrupting production. A larger bulk of cold scrap is accommodated by specially designed 30-ton electric furnace

■ TO STEP UP melting capacity sufficiently to keep pace with finishing capacity, Rotary Electric Steel Co., Detroit, has completed a new melt shop and transferred steelmaking operations to it without seriously interrupting production. Rolling capacity is approximately 12,000 tons per month, hitherto supplied by a single 50-ton electric furnace, and

now supplemented by a new 30-ton Heroult furnace of special design to accommodate a larger bulk of cold scrap.

The new melt shop building measures 160 x 120 feet in size, comprising a charging bay and a pouring bay, the former 70 feet wide and 18 feet above the ground or pit level. The two furnaces are set on either

side of a central transformer which extends from the top to a point well above the electrode structure of the

The transformer house is cut in half vertically by a bay and is on two levels. Transformers on the top level have switches and other electrical elements beneath them. The entire setup can be accommodated in a 30 x 20-foot structure.

Transformer for the 30-ton furnace is rated at 12,500 kilovolt-amperes; that for the 50-ton furnace is rated at 10,000 kilovolt-amperes. Both furnaces use 20-inch graphite electrodes considered to be about twice as long as used in electric furnace. They are threaded on the top as they are consumed and can be attached quickly.

Bricked platforms 21 feet wide and 26 feet deep are used for the furnaces, the entire structure tilting with the furnaces. A mechanism for tilting the furnace platform and providing a forward tilt of 40 degrees and a backward tilt of 18 degrees.

This furnace is of the "expanded top" type because it is one of the furnaces with a diameter at floor line is 18 feet 8 inches. From this point up, the side plates are curved and flare out to a roof diameter of 24 feet 8 inches, the same as that of the roof used on



(Upper) Furnace roofs are hoisted on the ground floor beneath the main floor, and then are hoisted through hatches in the floor into position on the furnace right background is the mechanism for the 30-ton furnace. Charging floor showing the mechanism of floor which may be removed bringing new roofs up. In the background are charging machine and loaded by



# Better Control

OFF-GAUGE WORK  
LESS SPOILAGE  
LESS DIE WEAR

ss is one of a complete line of  
o metal working presses suit-  
forming airplane, automobile,  
er deep drawn products.

double-action model, it is built  
racy and full control at high  
g speeds. Notice particularly  
plete control board. A single  
, working at floor level, can  
controls for these 7 features:

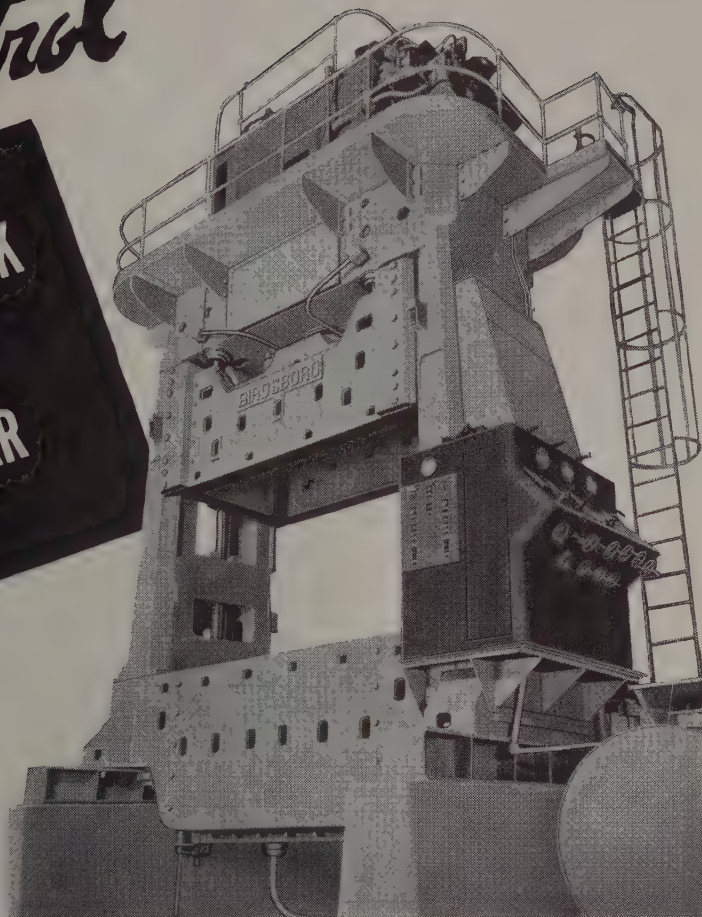
one of 4 sequences to do work and auto-  
strip it from the punch or the die.

t length of stroke and operating level of  
older, inner slide, and die cushion.

b approach speed with automatic slowing  
tely prior to contact.

omatic control of blank holder pressure  
or to and during draw.

omatic pressure control of blank holder,  
de, and die cushion.



**6.** Automatic performance of a full working cycle by pressing one button once. Safety button instantly interrupts the automatic cycle in case of trouble.

**7.** Independent or interlocked operation of the inner slide and blank holder.

By a simple change-over, the operation of the press may be converted from double to single action, using the combined faces of the blank holder and inner slide.

Engineered, controlled, and built entirely by Birdsboro, this press serves to illustrate Birdsboro's ability to meet your need for modern, high production presses.

ERY • CRUSHING MACHINERY • STEEL CASTINGS • STEEL MILL EQUIPMENT • STEEL AND CHILL ROLLS • SPECIAL MACHINERY

## BIRDSBORO

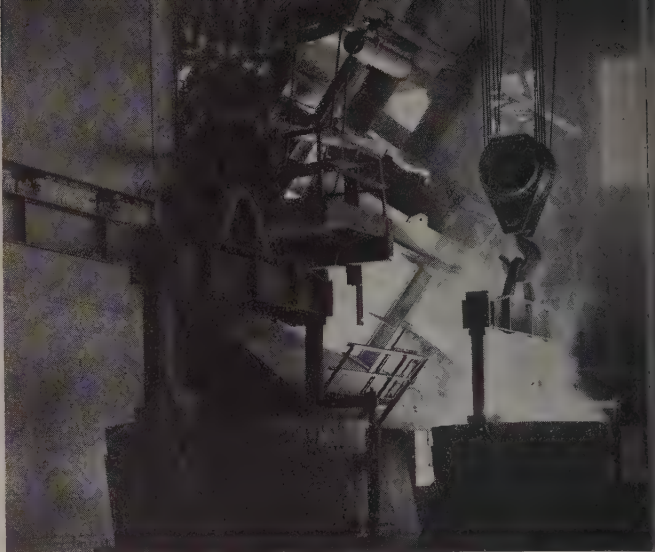
STEEL FOUNDRY AND MACHINE COMPANY  
PLANTS AT BIRDSBORO AND READING, PENNSYLVANIA



furnace. By expanding the volume of the furnace above the charging and pouring line a 15 to 20 per cent increase in the amount of cold scrap which can be charged is effected, resulting in appreciable economy in this instance because the bulk of the scrap charged is of the light variety such as bundled sheets, busheling and the like.

The furnace roofs are bricked up on the ground level beneath the charging floor. When completed, a crane removes square hatches in the charging floor and the assembled roof can be hoisted up through the floor and over onto the furnace quickly. Roofs have a life of about 100 heats, and the furnaces are operated on a basis of about four heats daily, thus indicating roofs must be replaced once a month when a furnace is in continuous operation. Life of sidewall refractories is somewhat longer, ranging from 125 to 150 heats.

Charging of the furnaces is handled by a 5-ton Morgan charging machine which was moved intact from its former location in an adjoining building which has now been converted into a stockhouse. Because of the existing structures, it was necessary to devise some uncon-



**Tapping a 50-ton heat of steel in the new furnace and platform of their forward tilt.**

ventional means to handle the loading and positioning of charging buggies. The building wall on the far side of the charging platforms was cut away at the center and a 30 by 70-foot platform extended into the stockhouse. On this platform are three tracks carrying the charging buggies, length being sufficient to accommodate seven buggies of four boxes each. These tracks, it will be understood, are at right angles to

the charging track in the melt shop. The boxes are loaded by the magnet and crane, the boxes of the overhead type span and 15-ton rating. The boxes have been loaded by placing the magnet on the last buggy and moving it to the limit of the magnet's reach.

In the melt shop the buggies are moved to the left to switch to the charging track; the buggy travels on this curve and can be moved enough with loading to permit the first buggy to be moved to the peel of the charging track. Tail tracks have been provided at either end of the buggies to permit the buggy to be moved far enough along the charging track to clear the switch with the loading track. That the loaded boxes are at the charging door of the furnace. This ingenious arrangement allows charging boxes to be brought alongside the furnaces with a minimum length and no independent power required for the buggies.

The larger of the two taps heats averaging 60 pounds in weight at 6-10 minutes.

(Please turn to page 10)



(Upper) Buggies on the charging track which extends out into the stockhouse. These cars are moved by the magnet and crane, shown at the top of the page. The ladle crane of 75-ton capacity is shown at the bottom of the page, the filled ladle over the molds. Note emergency operator along right side of the ladle.





# Accuracy

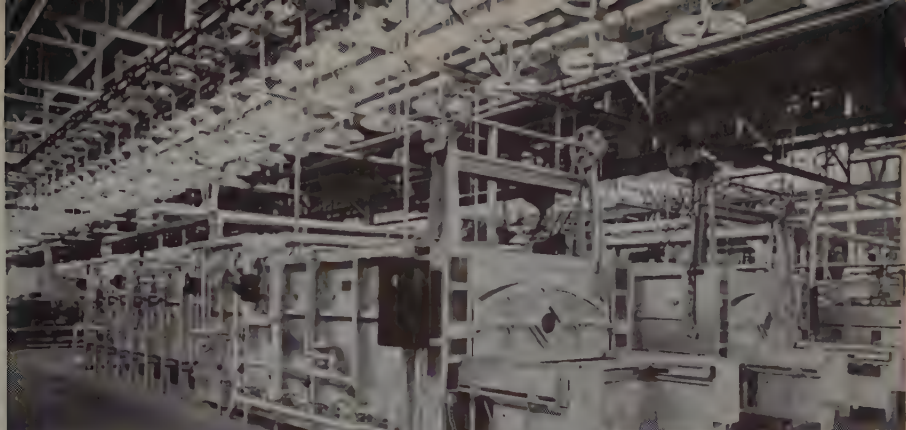
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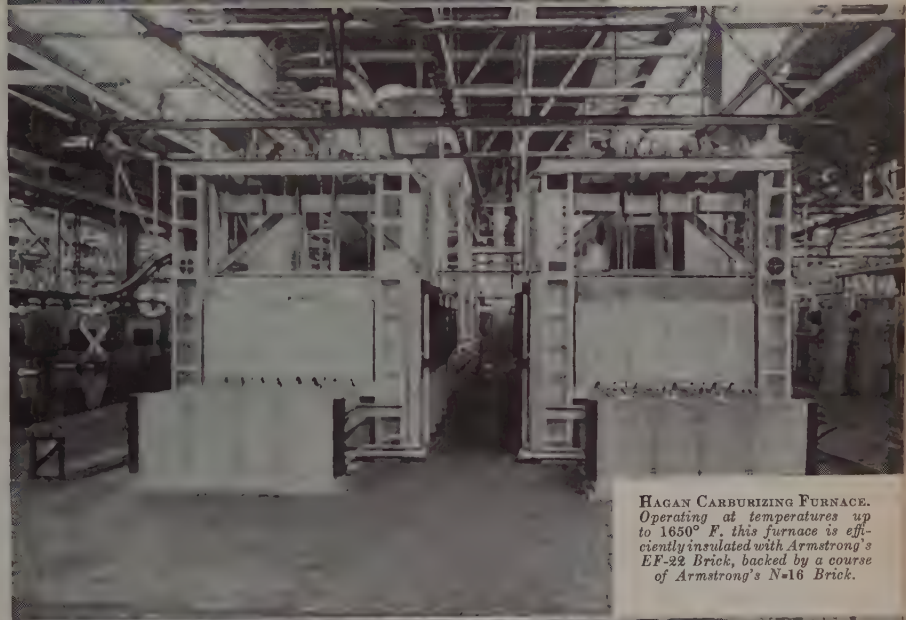
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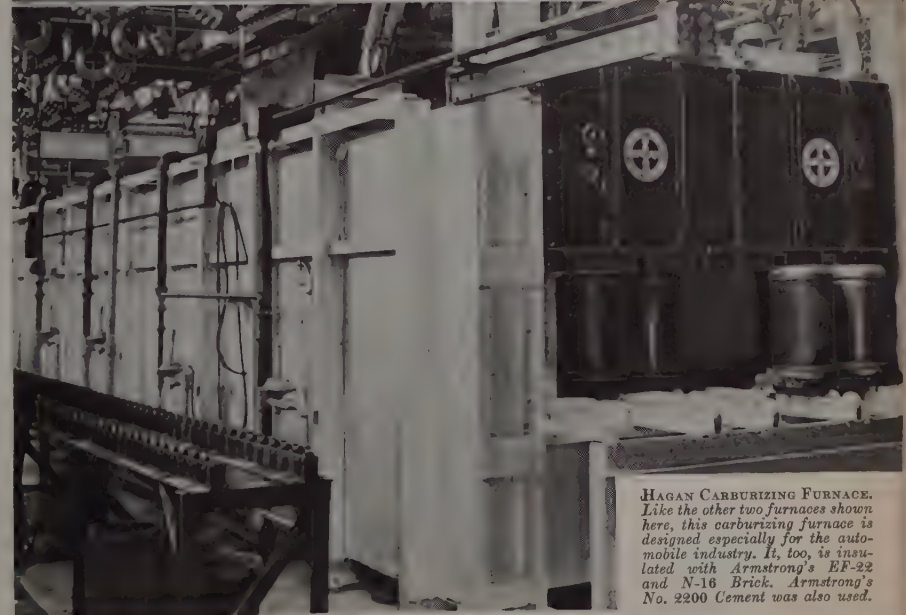
about Armstrong's High  
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ision, 985 Con-  
e, Pennsylvania.



**HAGAN ANNEALING FURNACE.**  
*This furnace operates at temperatures up to 1780° F. It is lined with Armstrong's EF-22 Insulating Fire Brick, with a course of Armstrong's N-16 Brick back of it.*



**HAGAN CARBURIZING FURNACE.**  
*Operating at temperatures up to 1650° F. this furnace is efficiently insulated with Armstrong's EF-22 Brick, backed by a course of Armstrong's N-16 Brick.*

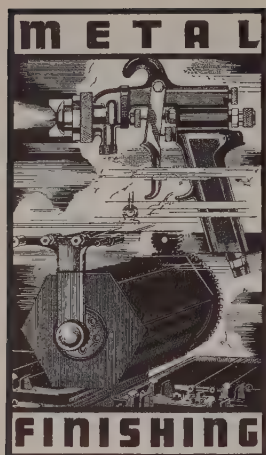


**HAGAN CARBURIZING FURNACE.**  
*Like the other two furnaces shown here, this carburizing furnace is designed especially for the automobile industry. It, too, is insulated with Armstrong's EF-22 and N-16 Brick. Armstrong's No. 2200 Cement was also used.*

## Armstrong's HIGH TEMPERATURE INSULATION

INSULATING FIRE BRICK  
HIGH TEMPERATURE BLOCK

PLASTIC CEMENTS  
DIATOMACEOUS EARTHS



# Automatic Finishing

New equipment automatically and continuously applies enamel to steel strip and then bakes before it is rewound. On a second machine strip is formed, cut and punched automatically while in continuous motion to make slats for venetian blinds at high speed

By J. L. HUNTER

General Manager  
Hunter Engineering Co.  
Riverside, Calif.

■ A RECENTLY developed, flexible steel Venetian blind has met with an extremely favorable reaction in the Southern California market where dealers handling these blinds have sold better than 85 per cent of their orders in steel in preference to wood construction. This promises to be a rapidly expanding field for use of strip steel.

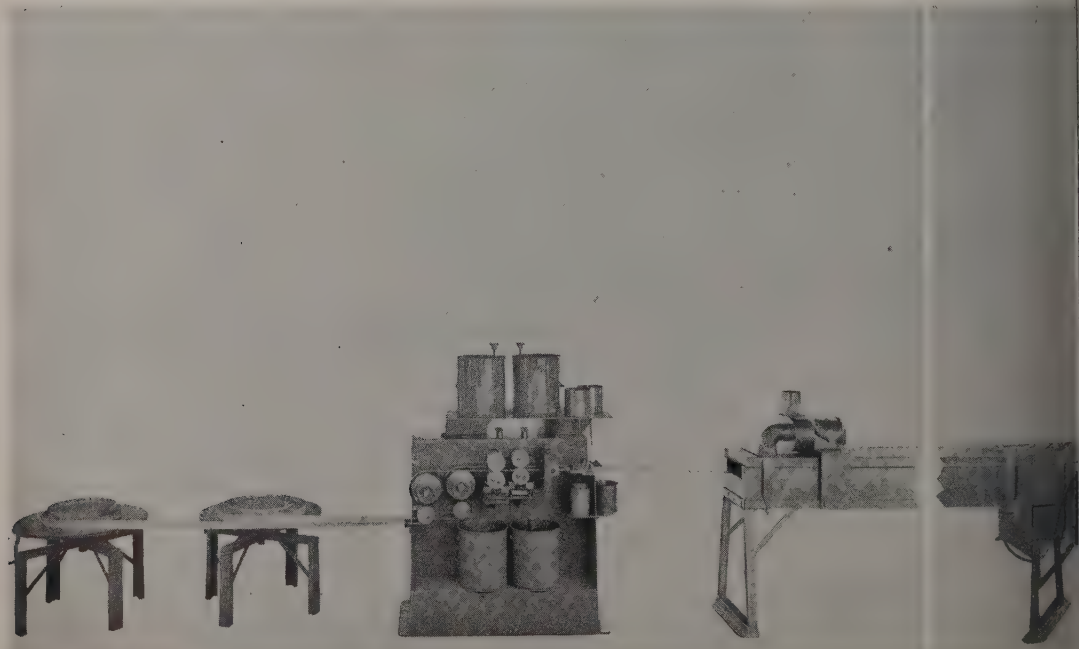
One of the most interesting things about the entire development is that

automatic machinery has been produced to handle all of the finishing and fabricating operations involved. The steel is electrogalvanized cold-rolled material which first is given a dipped enamel coating and then is baked in an automatic setup before it is fed to the automatic fabricating machine. Both the finishing and fabricating machines are of a continuous, entirely automatic type and are available for lease to manufacturers who are interested in producing this type of blind.

At the bottom of these two pages is shown a lineup of finishing equipment arranged to handle two continuous strips simultaneously and recently installed by a steel manufac-

turer. In the actual provision is made for coils of coils at the entry end of the equipment so that the material moves continuously. Finished material is moved on the rewinding end of the machine. The particular setup is designed for finishing steel Venetian blind material with a baked enamel finish.

Fig. 1—Automatic continuous finishing setup. Two strips of material are simultaneously enameled in different colors. Strip moves from left to right through paint rolls, baking oven, and finally to recoiling stand to recoiling line at extreme right.





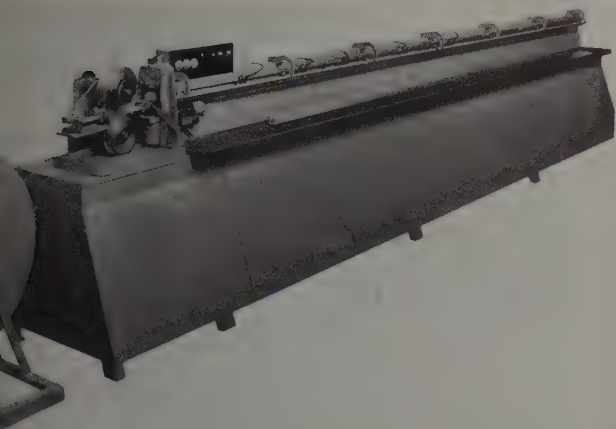
which bakes in one  
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s of electric heating  
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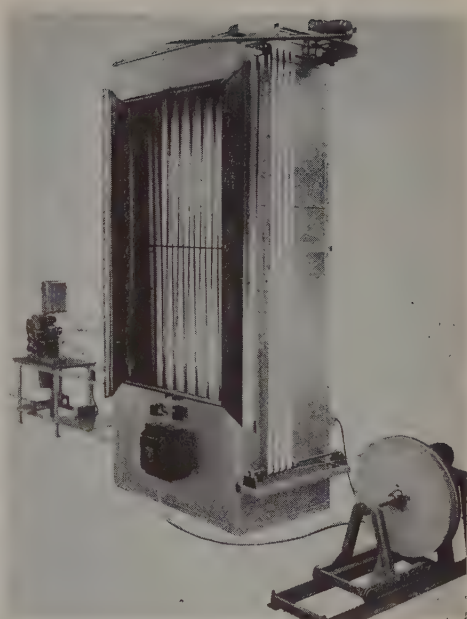
outfit. The same type of equipment  
could be used for finishing various  
width strips up to 6 or 8 inches.  
However, beyond this width some  
radical departures in design would  
be required.

A somewhat similar arrangement  
is shown in Fig. 2. This equipment  
employs a vertical type oven where  
the strip is passed back and forth  
in a vertical direction as may be  
seen through the open door of the  
machine. This oven, and paint  
equipment at the left rear, is also  
of the continuous type but is de-  
signed to handle only one strip of  
steel. This equipment has a pro-



The time required  
colors in this equip-  
ment is approximately two minutes.  
It requires only one at-  
tention of the entire

**Fig. 3—Continuous automatic machine** shown here forms venetian blind slats, cuts slats to length and punches mounting holes while strip is in motion—all at extremely high rate of speed



**Fig. 2—Another setup for automatic continuous finishing of steel strip.** This unit utilizes a vertical type oven arrangement and so is quite compact, requiring little floor space. It handles only one strip at a time, however. Output is 50 feet of finished strip per minute

duction of 50 feet a minute, baking the enamel at 300 degrees Fahr. for a period of 30 minutes. It is particularly useful with the slower baking enamels which may require a baking period up to 30 minutes. Double wall construction with insulating material between conserves heat developed in the oven by the

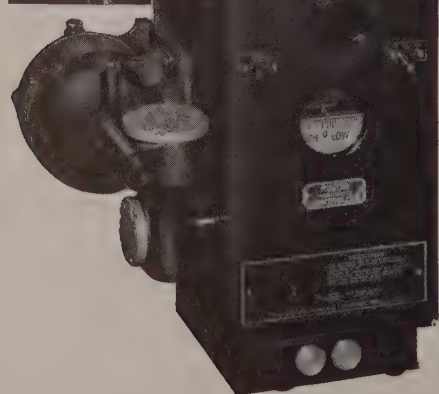
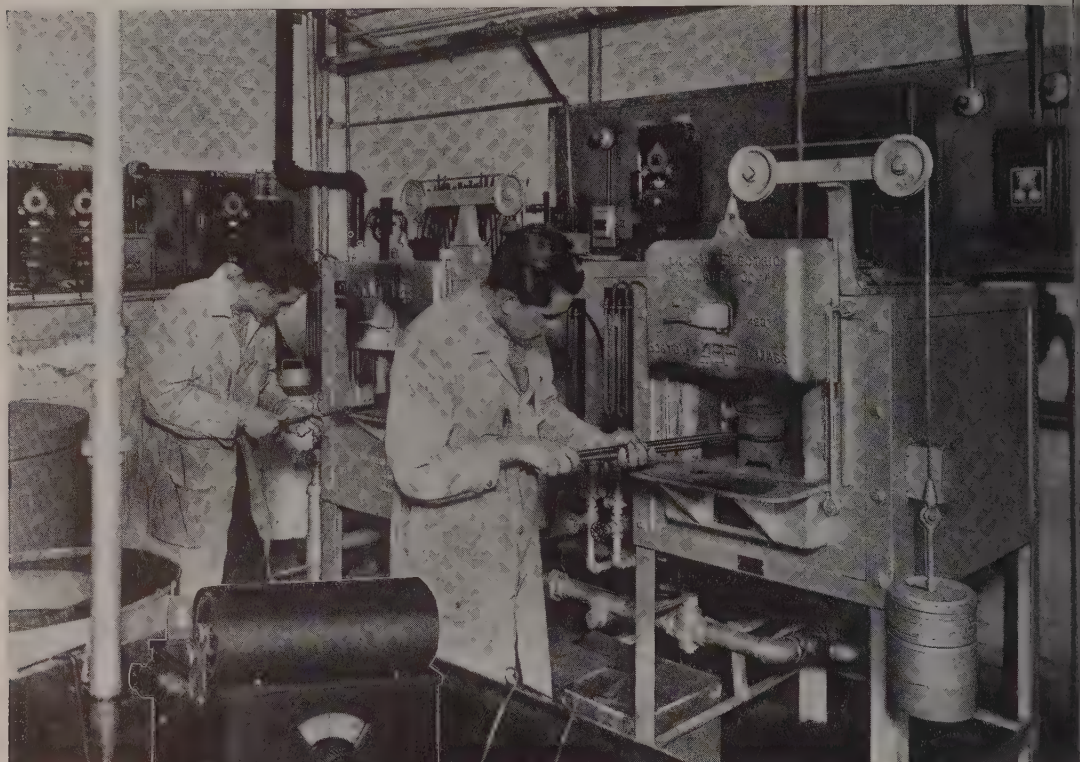
(Please turn to Page 78)





TOLERANCE  
 $\pm .0002''$

# HAIR-LINE TEMPERATURE CONTROL ES



## FOXBORO PYROMETERS provide con- practically no temperature variation treatment of parts for Schick Shavers

Accurate control in the heat treatment of such small parts as cutters and springs largely determines the fine reputation of Schick shavers. These parts heat rapidly and unless accurately applied, attendant distortion is great. » » » Electric furnaces by Schick for shaver manufacture are equipped with Potentiometer Control Pyrometers. With the use of these instruments, heat treatment of parts is accomplished uniformly. Parts are hardened to precision standards—tolerances minus .0002 in. are maintained. A quality shaver is a result. In every plant where heat-treating is a process step, Foxboro instruments exist, and in every such instance, Foxboro Control Pyrometers provide the answer to the demand for control that is uniform and completely dependable. Write us your system describing equipment and temperatures employed. We will assist wherever possible.

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# Road Machinery

and steel fabrications are utilized in all types heavy equipment. Massive machine frames, box sections made from structural shapes. Welding, these are heated and entire frame sized to shape while hot. More than 1000 and fixtures assure interchangeable parts



the heavy duty road manufactured at the Adams Mfg. Co., Indianapolis, these differing of engine supplied. s a 62-horsepower e No. 50 a 59-horse-engine. These units, and surface main-trading and scarify-load-mix work, and are built entirely by

ature of the diesel it is arranged to up as a gasoline operation, eliminat- auxiliary engines, starters and heavy- etc. This is accom- ating a lever which each cylinder head, auxiliary combustion reduce compression starting. Auxiliary have a spark plug high tension mag- ally engaged by the which also operates a connecting the gaso-

engine is cranked by starts as a gasoline predetermined num- is, it shifts automat- operation. The aux- lose, restoring the ion pressure, Mag- etor are disengaged The diesel fuel in- starts to function

Tandem drive box for unit is built from two d face to face. Fig. 2. ame for motor grader. frame is heated and ape as shown here

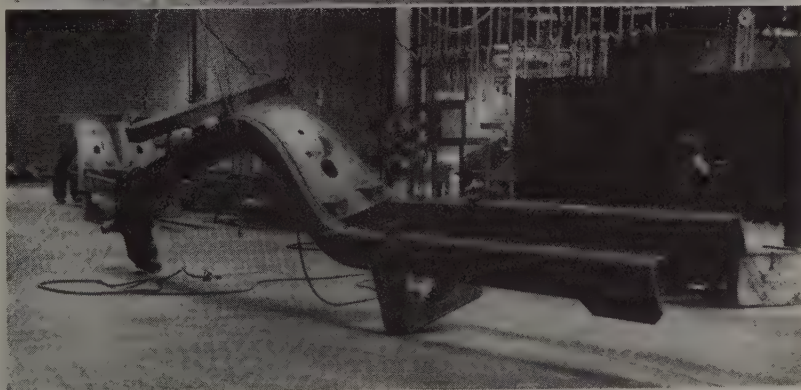
and the engine continues to operate with an uninterrupted flow of power.

Traction is one of the essentials for a machine of this type so models are available with 4 and 8-wheel tandem drive as well as conventional 2-wheel drive. All use extremely large pneumatic tires, 40 x 8 (9.00-24) or 42 x 9 (9.75-24). Some tandem drives use the gigantic 12.75-24 low pressure tires.

Wheels for these huge tires are made from welded steel, the rims being formed from rolled sections and butt welded at the ends. Wheel or disk portion is flame cut from steel plate. The drive for each side of the grader is in an individual

box, Fig. 1 which pivots at the middle around the drive axle. This box contains axles at each end for the tandem wheels. Drive axle at center is connected to front and rear tandem wheel axles by individual roller-chain drives, 2-inch pitch, included in this box. All bearings are ball or tapered roller and are mounted in bearing housings bolted to frames or tandem boxes. Cast housings for the tandem drive units are eccentric so chain tension may be adjusted easily by rotating the housing.

These tandem boxes are made by torch cutting 18-inch U-channels. Two channels are placed face to face to form the box section and the



ends closed by welding in place two heavy formed steel plates, seen in Fig. 1. As may well be imagined, shafts for such equipment as this are of large proportions, the main drive shaft measures 5½ inches in diameter at the bull gear in the rear housing, and 4½ inches at the bearings. Heavy duty, tapered roller bearings with two rawhide seals in each bearing exclude dirt and dust. Wheel axles are 3½ inches in diameter and from center to center of front and rear axles of the tandem drives measure 58 inches.

Possibly one of the most interesting parts of the grader is the all-welded frame shown separately in Fig. 2. This construction is an important feature of these graders as it permits maximum visibility to the operator, all portions of the road surface being visible and unobstructed except for a narrow strip at the center. This huge, solid box section also adds great rigidity to the entire machine. It is constructed in a somewhat unconventional

and novel manner for this grader.

After the U-channel sections forming side members of the frame have been cut to length, they are assembled in a welding fixture and the top and bottom plates tack welded in position. Also various fittings along its length and the large steel casting at the front are welded on. Then the assembly is removed from the jig and the welds positioned completely for downhand welding. This procedure permits full benefits of large, heavily coated electrodes to be obtained, separates the welding into two different parts, permits men to become familiar with the particular type they do and so aids in production of better welds.

After welding is completed, the entire assembly is taken to a heating furnace. This is a large gas-fired unit which is used to heat the work to forging temperature. When hot, roller bed of furnace is actuated to dump the frame into the bed of a bulldozer. The large bulldozer

forms the frame to the in Fig. 2, after which allowed to cool.

The large bulldozer rear of the furnace furnaces and equipment here for heating other parts of road. Typical parts include bon renewable cutting grader blades. These forging temperature shaped in a bulldo hardened and temper in an automatic polished in Fig. 3. This series of grinding wheels and a conveyor matically carries the the wheels.

#### Knives Painted Au

The exit end of the includes equipment ically applies a coat paint to the knives. here removes the comp polished and painted the paint track. Place trucks, the knives are assembly department.

Arrangement of the J. D. Adams plant layout of departments ing processes and ha ment received careful entire plant is on of storage of steel and at the northeast section are numerous large stock to length. All gas cutting equipment Nearby is the machine small parts are produ the welding depart wheels, gear boxes, fra constructed. This depe far the largest in the as it includes provision the large welded fram on more-or-less a stra up. The forging and shop is toward the nor plant, the welding dea tending through a go the central and south plant, with the assem and shipping departm south end.

Welding methods, du treme importance of v have been given most c All Adams road macha ricated entirely by arc welded assemblies are special jigs designed f ticular assembly. The

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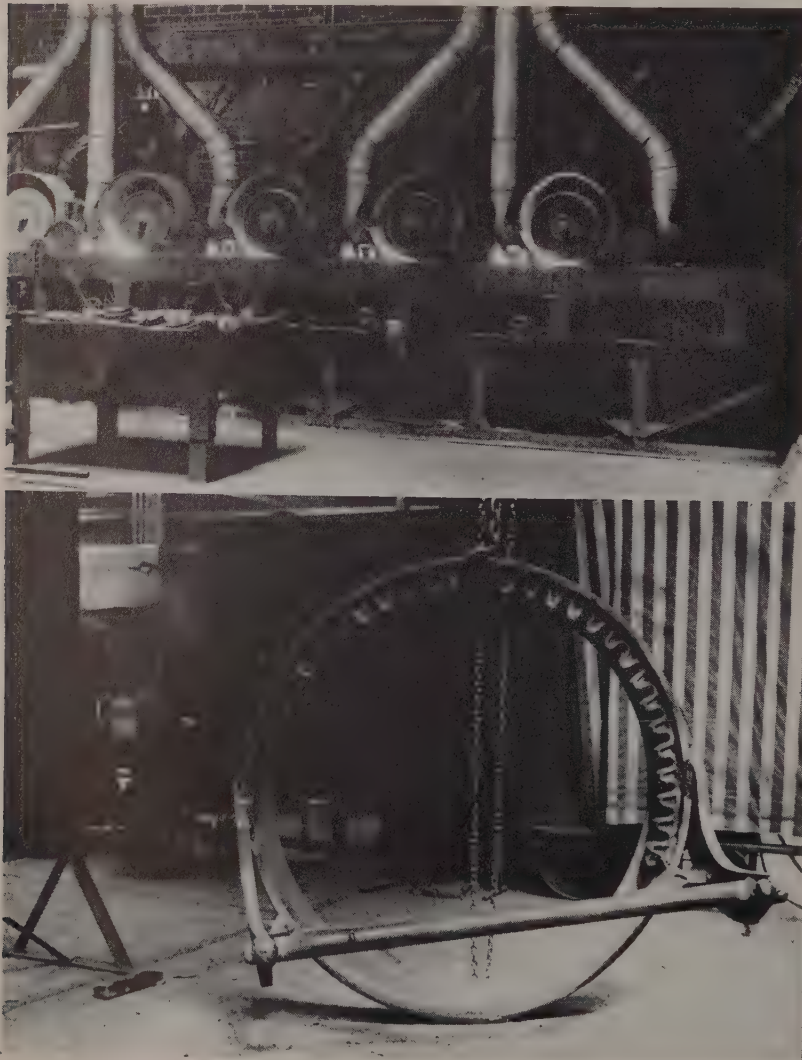
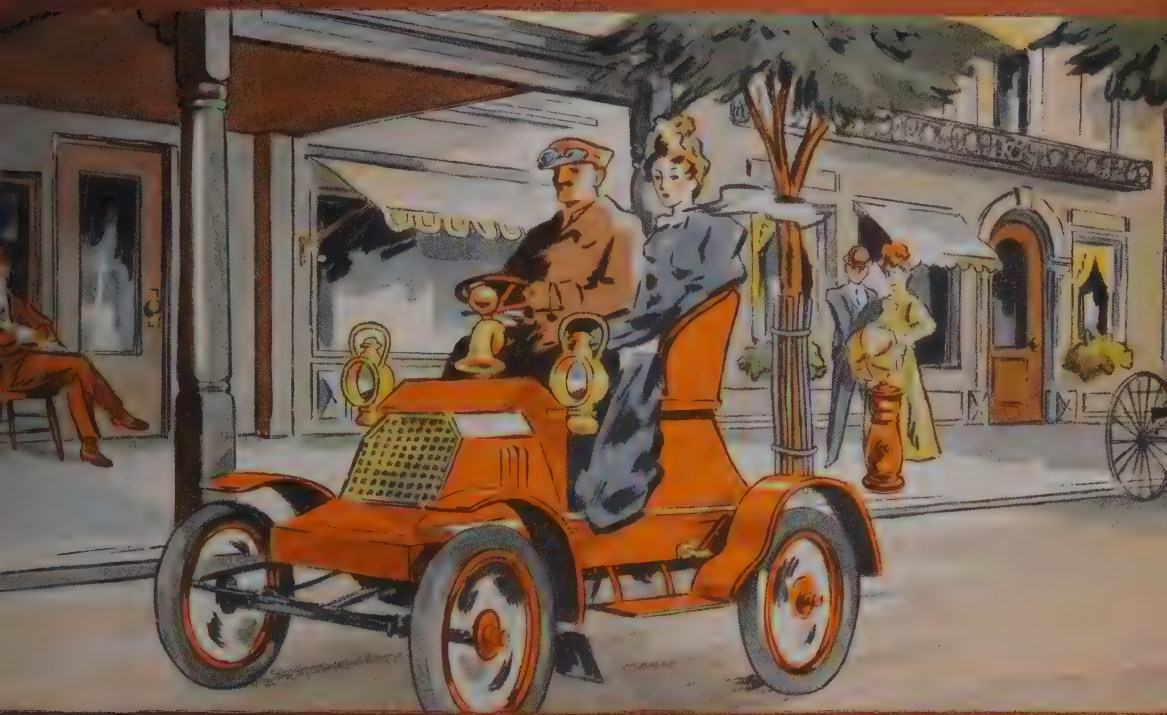


Fig. 3. (Upper)—Autom and polishing setup for grader blades. Fig. 4. (L circle with reversing rack cast in groups of three rolled steel from





**AT THE TURN OF THE CENTURY...**

## **BRASS WAS BRASS**

ard the close of the last century, many small  
s began the task of creating new products  
new ideas. Buggies were being propelled by  
made explosions. Electrical energy, newly  
essed, was looking for fields to conquer. In  
e, our great industrial upsurge was gaining  
entum. • The copper and brass requirements  
ese budding industries were relatively simple  
d The American Brass Company, already  
half a century's experience behind it, sup-  
many of them. But the pace was fast, and  
ands for newer copper alloys in a wider range

of shapes came with startling rapidity. • Many  
answers to these new-found metal problems orig-  
inated in the laboratories and plants of The Amer-  
ican Brass Company, then and now the largest  
fabricator of copper and copper alloys. • It is sig-  
nificant that the founders of these new industries,  
some of which today are leaders in their fields,  
continue to regard this Company as the logical  
source of supply, not only for copper and its many  
useful alloys—but also for helpful technical or  
engineering cooperation in their selection of the  
best metals for specific applications.

### **THE AMERICAN BRASS COMPANY**

General Offices: Waterbury, Connecticut • Subsidiary of Anaconda Copper Mining Company

*Anaconda Copper & Copper Alloys*

# A Complete Range of



**AN**  
**M**

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Arsenic  
"D.H."  
Lead

## **BRASS**

From  
Brass  
Brass,  
Forging  
cial Br

## **BRONZE**

Archit  
Bushin  
mercia  
ware,  
phor, a

## **NICKEL**

From 5  
content  
to 18%

## **ADMIRALTY**

## **AMBRA**

## **AMBRA**

## **AVIAL**

## **BENEDI**

## **BERYL**

## **CUPRO**

## **EVERDU**

## **MUNTZ**

## **SUPER**

## **TEMPER**

## **TOBIN**

\*Trade M  
Patent C

# Anaconda Copper



# and Brass Products

by THE AMERICAN BRASS COMPANY

Anaconda Metals include Copper, and Copper alloyed with Zinc, Tin, Nickel, Aluminum, Lead, Silicon, Manganese, Beryllium and other elements in all combinations that can be manufactured commercially in the form of Sheets, Plates, Strips, Wire, Rods, Bars, Seamless Tubes, Extruded, Rolled and Drawn Special Shapes, Hot Pressed Parts and Pressure Die Castings.

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- While a comparatively few copper alloys fill the majority of industrial requirements, The American Brass Company is successfully producing a wide range of Special Alloys. These were developed with due consideration to the many factors governing individual applications:—corrosion, erosion, abrasion, stress, fatigue, conductivity, appearance, machinability, weldability—and cost. Typical examples of the advantages made possible through accurately controlled metallurgy are the following well-known copper alloys:
  - By adding a small but controlled amount of lead to ordinary yellow brass, the free-cutting characteristics of this metal are tremendously improved, thereby resulting in substantial savings in machining time, but without materially changing its desirable physical properties.
  - The addition of from 5% to 30% nickel to various copper-zinc alloys results in nickel silver—a durable, workable and widely used alloy with high resistance to general corrosion and an extremely attractive color ranging from soft ivory white to a brilliant silvery white.
  - Everdur, The American Brass Company's trade-marked alloy is pure copper, with small amounts of silicon, manganese and other controlled elements added, producing a moderately priced alloy of high strength, with unusual resistance to a wide range of corroding agents, and with exceptional workability and weldability.
  - It is the primary function of the Engineering and Technical Departments of The American Brass Company to give every assistance to metal users by making available to them the technical and metallurgical knowledge acquired during a century of specialization. Possibly you can benefit from the broad experience of this organized service. Your inquiries are welcome. Address The American Brass Company, General Offices: Waterbury, Connecticut.

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# Anaconda Copper & Copper Alloys



# Hearth

(from Page 41)

ees lower, depending  
nt and length of time  
duced.

on conditions influ-  
se in temperature of  
blast furnaces and  
eisch stated that the  
ature lost in transit  
consuming about 50  
degrees. By use of  
d faster time in tran-  
al would be delivered  
with a resultant sav-  
The amount of kish  
es would be greatly  
peaker stated.

h's opinion, anything  
ne toward sizing and  
sizing coke and lime-  
mity in coke proper-  
l of moisture content  
rt undoubtedly would  
er regularity of blast

control in the blast  
difficult, yet the open-  
has the right to ex-  
nt of his iron within  
n laid down, accord-  
Slater, blast furnace  
Republic Steel Corp.,  
speaker made a plea  
h operators to send  
the blast furnace in a  
contending that this  
influence on control  
iron.

ointed out that mois-  
the blast is becom-  
rtant and he stated  
the open-hearth opera-  
uniformity in hot  
er the blast furnace  
o air-conditioned fur-  
now is being under-  
Woodward Iron Co.  
ment of blast with  
eans of hearth con-  
furnace. If econom-  
e devised to induce  
cent oxygen, it will  
urnace man a means  
ad of waiting several  
burden to take effect.

## Ladle Practice

ed top ladle used in  
as placed in service  
nt, Jones & Laughlin  
tsburgh, April, 1917.  
brought out by J. R.  
erintendent of blast  
his company, who  
"Mixer-Type Ladles."  
on capacity, each  
ut six round trips  
s and carrying iron  
d that time. The  
that after the ladle  
metal temperature  
about 50 degrees  
eafter levels off to  
r hour. Firestone is

used exclusively in relining the  
ladles. Average tonnage carried per  
ladle is about 59 tons per trip and  
life of one lining, 41,000 tons. He  
mentioned that the only successful  
way to combat the tendency of the  
ladle to skull is to use it as often as  
possible and attempt to burn out  
the skull.

The speaker warned that light  
steel scrap such as pipe ends, rolled  
strip, and bars lighter than 2 x 2  
inches cannot be remelted in the  
ladle successfully. Instead scrap of  
this type floats and "gums up" the  
roof of the ladle. From 1 to 3 tons  
of heavy scrap, however, may be  
remelted in a ladle of this type  
for a few trips at a time.

Speaking on the economical  
amount of open-hearth slag that  
can be used in the blast furnace,  
one operator mentioned that 625  
pounds per ton of iron can be in-  
cluded in the blast furnace burden  
with good results. At his particular  
plant, iron containing 0.600 per cent  
phosphorus is used for making open-  
hearth steel intended for strip  
whereas the normal run of iron (no  
open-hearth slag used in the burden)  
contained 0.300 per cent phosphorus.

## Discusses Blown Metal

A. C. Keller, assistant metallurgist,  
Jones & Laughlin Steel Corp.,  
Aliquippa, Pa. dealing with the  
grade of iron most economical for  
production of blown metal, stressed  
importance of temperature and slag  
condition. Low-silicon iron at a low  
physical temperature may result in  
cold blown metal. Excessively high  
silicon iron requires large quanti-  
ties of scrap, or steam, or both to  
control the finished temperature of  
blown metal. Phosphorus should be  
held to a minimum of 0.200 per cent.  
Manganese content of the iron is  
of relatively minor importance, the  
speaker stated. Iron containing  
under 0.040 per cent sulphur is pre-  
ferable. Mr. Keller directed atten-  
tion to the fact that iron from the  
mixer-type ladle is about 100 de-  
grees hotter than metal from the  
mixer. Iron with a temperature  
from 2350 to 2450 degrees Fahr. is  
suitable for the converter. Blown  
metal should be about 2900 degrees  
as it leaves the vessel.

Discussion of instrumentation of  
modern open-hearth furnaces  
brought out the fact that a rebound  
from the helpers frequently occurs  
when instruments are installed.  
Like anything else, a speaker stated,  
instruments have to be sold. When  
they are placed on a furnace hav-  
ing the most intelligent help and  
this furnace leads the procession  
from the tonnage standpoint, other  
helpers become interested in instru-  
mentation.

At a shop in the Pittsburgh dis-  
trict fully equipped with pressure  
control instruments a saving of 15

per cent in the fuel is reported. By  
equipping the roof with tempera-  
ture control a 10 to 20 per cent sav-  
ing in the roof life results.

Dust contamination is avoided by  
locating all instruments in an air-  
conditioned room, according to one  
operator. However, he warned that  
if air conditioning fails, the instru-  
ments will be affected.

A special radiation pyrometer for  
recording bath temperature was de-  
scribed by Dr. M. J. Bradley, engi-  
neer, Leeds & Northrup Co., Phila-  
delphia. The pyrometer is sighted  
down a 2-inch pipe directly at the  
metal. The length of the pipe varies.  
The end extends into the metal  
from 12 to 18 inches and readings  
of the temperature are secured in  
from 10 to 12 seconds. Within the  
2-inch diameter tube there is a 1½  
inch pipe; compressed air is passed  
between to prevent slag and metal  
from entering. The end is made of  
cold-rolled steel and has a specified  
opening. The entire unit is mounted  
on a rubber-tired wagon to facilitate  
transfer from furnace to furnace.  
Approximately 1 pound air pressure  
is sufficient for an immersion of 4  
minutes. Life of the tube is about  
100 readings.

An operator in the Chicago dis-  
trict who has used this instrument  
for a month pointed out that any  
warping in the tube causes the  
quartz lenses to get out of alignment.  
He recommended a ⅝-inch orifice  
for 6-foot tubes and ¾-inch orifice  
for 8-foot tubes. His experiments in-  
dicated that pressures ranging from  
9 to 11 pounds per square inch are  
required to keep the opening free  
from slag and steel. He made it  
plain that the instrument shows  
possibilities and that its weaknesses  
can be overcome.

## Facilitates Grain Growth

Consensus of opinion at least  
among laboratory men is that a bet-  
ter consistent grain growth is ob-  
tained when silicon and aluminum  
are used in combination.

One open-hearth operator in dis-  
cussing oxidation stated that he  
uses 5 pounds of aluminum per ton  
of metal. This is put over a bar and  
immersed in the bath of metal  
which is tapped from within 6 to 7  
minutes thereafter. He makes the  
silico-manganese addition in the  
ladle. The speaker pointed out that  
calcium silicate used in the ladle  
gives a cleaner steel but that a bet-  
ter grain size is obtained by putting  
the aluminum in the furnace.

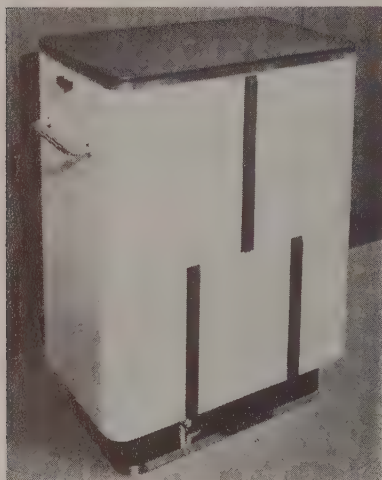
Use of automobile scrap in mak-  
ing extra deep drawing steel sheets  
is limited, according to the consensus  
of operators.

Most operators favor adding  
aluminum in the ladle and molds in  
making low-carbon rimming steel.  
One operator adds two-fifths in the  
ladle and three-fifths in the mold.

# NEW METAL PRODUCTS

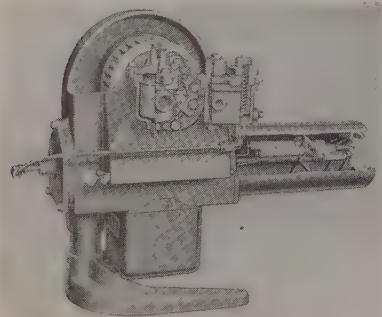
■ Something new in dental equipment is this portable, revolving cabinet, created by American Cabinet Co., Two Rivers, Wis., and styled by Designers for Industry Inc., Chicago.

Enameled steel cabinet has two working sides. Each end has a drop door medicine cabinet. There are 22 wood-steel, silent operating drawers and 50 glass trays. Four drawers are fitted with white rubber mats. Molded rubber top is 30



inches wide and 19 1/2 inches deep, providing a convenient working surface. Cabinet requires little space, however, and can be revolved in a 34 1/2-inch circle, being released from pedestal by a foot lever.

■ Rudy Furnace Co., Dowagiac, Mich., has introduced an oil burner that can be used as a conversion burner on any boiler or furnace as well as on air conditioning equip-



ment. Capacity of burner is from 1 to 3 gallons an hour. Burner can be furnished with or without controls.

■ A portable storage battery hand lamp that will cast a beam over half

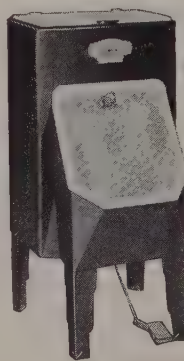
a mile and that will burn continuously for 10 hours on one full charge of its battery has been added to the line of U-C-Lite Mfg. Co., Chicago. An auxiliary bulb, operated by an independent switch, will burn 60 continuous hours.

A specially designed rubber reservoir collects battery fumes and pre-



vents spillage, eliminating corrosion of terminals. Battery may be recharged through the lamp head without removing battery from its case. A dashboard type switch can be furnished whereby the lamp battery can be charged direct from the charging system of an automobile.

■ Lyon Metal Products Inc., Aurora, Ill., announces a sanitary, warm-water handwasher, the Showerway. Water is held in a 6-gallon stainless



steel tank and runs through a showerhead by gravity, and not by force, when foot pedal is pressed. Washer uses liquid soap. Three models are available: One for use where no running water or electricity are available (hand-filled and heated by kerosine stove), another where electricity is available but no running water, the third, automatic, where both electricity and running water are available. In the electric models, temperature of water is thermostatically controlled. Washer

is fabricated of metal and finished in dark. A thorough handwash 8 ounces of water is

■ Cruse Refrigerator Co., Louisville, Ky., announces a "Yur-Self" dairy and refrigerator case. Eliminates provides unusual customers since doors easily reached. Outer visible panels are enameled, and linings are The wall type, with side, and the island working sides are av

■ Gar Wood Industries, Inc., Detroit, announces a unit for homes, ra



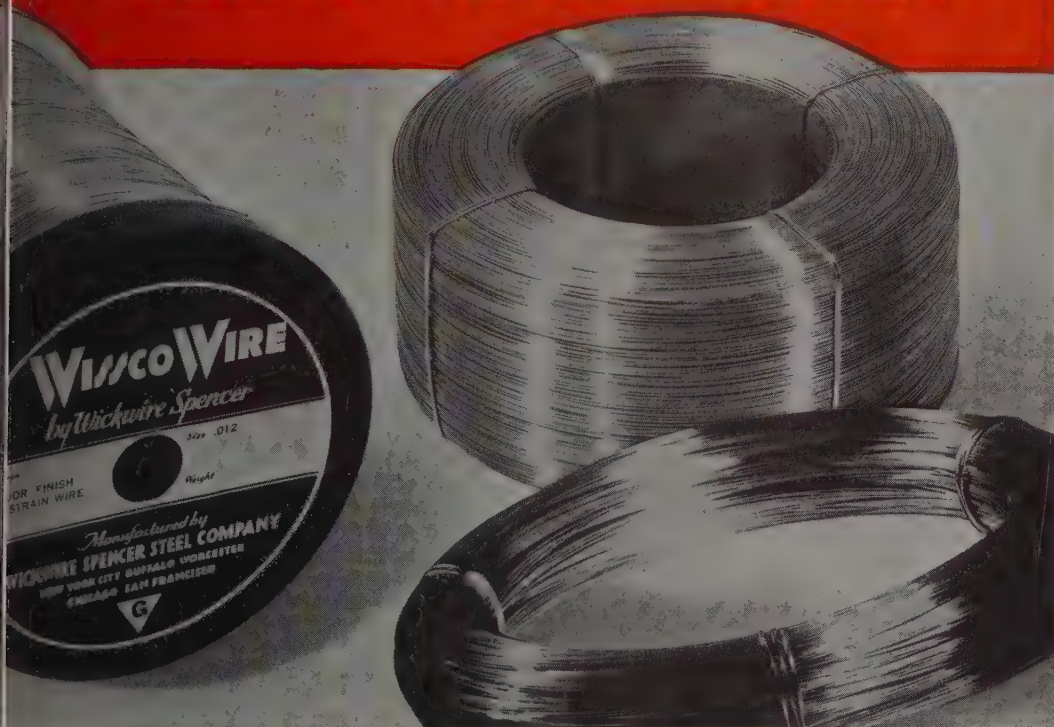
B.t.u.'s, which heats, circulates air in provides power-blower comes. Steam-type humidifier in a steel tube inside type, cloth filters having area and, when dislaundered. Multi-varmounted on rubber fation. The counter in which heat and air flow in opposite directed.

■ Bucyrus-Erie Co., Janesville, Wisc., offers a tractor grader for use with TD-18 TracTractor. B sidecast to either side. adjustment is set for the equipment can continuously, leaving an and rolling the earth windrow. The blade tilted to either side for banks and ditching.





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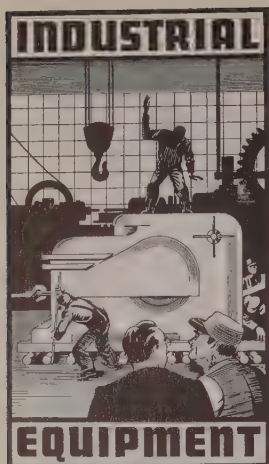
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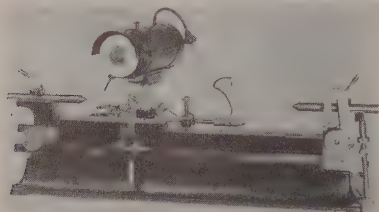
manufactures High and Low Carbon Wires—in various  
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our men on your wire problems, however large or small.

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by Wickwire Spencer



## Tool Grinder

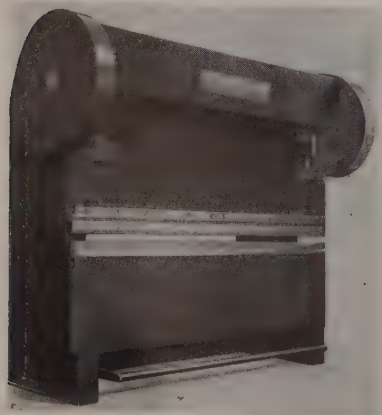
■ Precision Engineering & Mfg. Co., New Philadelphia, O., announces a grinder for cutters, reamers and taps with work centers mounted on a movable arm which is hinged at one end and equipped with quick-change, micromatic adjusting scale graduated in degrees at the other. Carriage permits



lengthwise grinding. Grinding wheel may be placed at any angle on work. Micromatic setting is provided for depth cutting.

## Bending Press

■ Steelweld Machinery Sales Division of Cyril Bath & Co., Cleveland, O., introduces smaller bending presses for handling material up to 10 feet by 10 gage. It has a one-piece all welded frame, heavy crown and side housings, full tapering ram with slides that are self-adjusting



and self-compensating for wear, solid forged eccentrics and a hollow bed. Because of frame stability, it is suitable for multiple punching, notching and other serial operations. Bed and ram take standard brake punches and dies.

## Vibration-Proof Potentiometer

■ C. J. Tagliabue Mfg. Co., Park and Nostrand avenues, Brooklyn, introduces vibration-proof Celestray in-



dicating potentiometer which has a safety shut-off, 15-inch scale with indications by a white, red, or green line of light on ground-glass and 0.1 per cent accuracy. New damped photoelectric circuit does not respond to abnormal disturbance of the light-beam. Vibration does not cause primary relay within the instrument to operate nor does vibration interfere with normal action of controller.

## Bar-Stock Rack

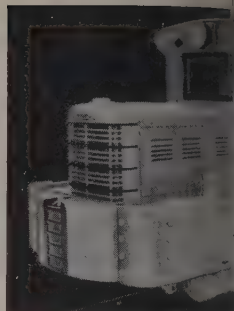
■ Pollard Bros. Mfg. Co., 5510 Northwest highway, Chicago, has



redesigned its bar stock rack so that extension arms are bolted to upright channels and can be placed 3 inches apart. Rack is made with double or single arms. The single-arm rack can be placed against the wall. Seven arms are supplied with each rack. Heavy cast base supports a channel 65 inches high and is wider than the arms.

## Gasoline Locomotive

■ Brookville Locomotive Co., Brookville, Pa., announces 2½ to 8-ton Ford-powered industrial locomotives



in any gage with 85 power V-8 engines have all-speed reverse forward speeds available in direction and dual-speed suspension, making possible speeds over poor tracks in localities where gas is expensive, Ford replaced with Buda-Lancaster diesel engine.

## Electrical Tester

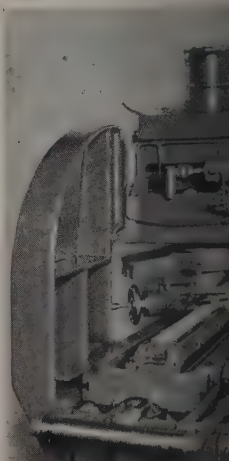
■ Universal Tester Mfg. Co., N. Oakley avenue, Chicago, introduced a universal tester which will test any electric bulb or fuse of any size



well as motor winding relays, and various circuits in two models, it is compact and simple to operate.

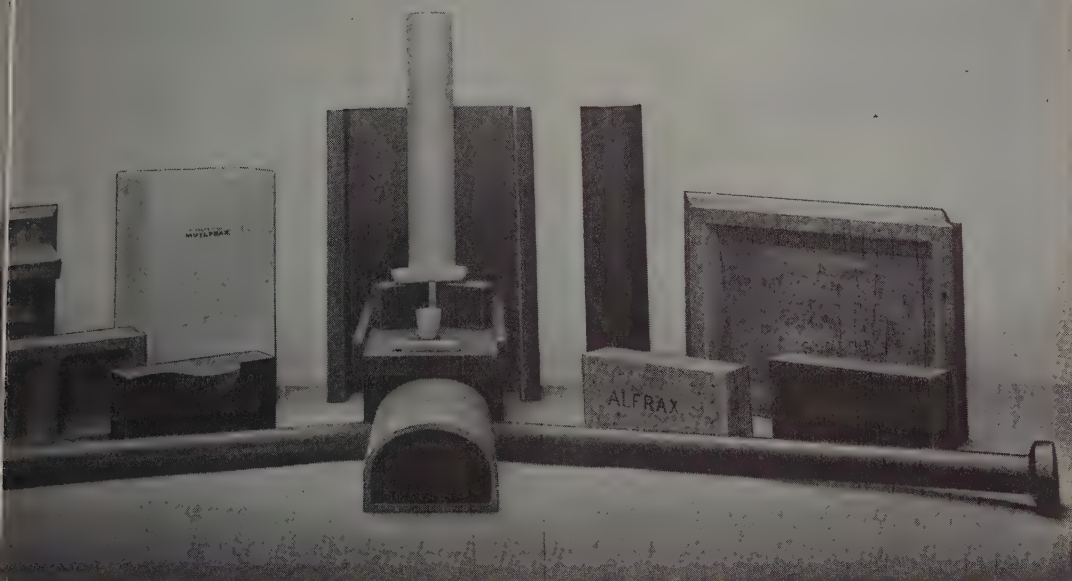
## Rack Type Gear

■ Michigan Tool Co., announces a heavy-duty





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gear-shaver with a hydraulic mechanism for continuous oscillation of the gear which is moved across rack while rack is moving endwise. Mechanism is interlocked with the machine controls, starting and stopping with machine. Lengths of oscillating stroke and speed are adjustable.

## Lift Truck

■ Easton Car & Construction Co., Easton, Pa., has built a low-lift six wheel electric truck for handling large bucket skids from soaking pits. Truck has six-wheel steer and 5-ton capacity. Operator's platform is set low to decrease head-



room necessary. Edison 24-cell battery furnishes power.

## Shallow-Well Pump

■ Crane Co., 836 South Michigan avenue, Chicago, offers shallow-well pumps in 250 and 375 gallons per hour sizes with both horizontal and vertical tank systems. Capable of 40 pounds maximum pressure with 22-foot suction, pumps have 1-inch suction and  $\frac{3}{4}$ -inch discharge. Power frame, water-end and base are readily accessible.

## Coil Cradle

■ F. J. Littell Machine Co., 4127 Ravenswood avenue, Chicago, has developed a cradle for coils 1 to 8 inches wide, weighing up to 3000 pounds. Cradle has a magnetic brake which is applied when loop, formed during unwinding, trips limit switch. For handling stock



0.015-inch thick, reel has idling side-guide disks to prevent curling edges of stock. Coil is supported by hob-nurled collars mounted on two parallel shafts.

## Stamp Holder

■ M. E. Cunningham Co., 172 East Carson street, Pittsburgh, has marketed a safety steel stamp holder for marking large size, hot or cold tubes, axles and other round objects,



Holding mechanism is of friction type. One stamp can be pushed out while another is being inserted, making quick changes possible. Operator, by tightening his grip, clamps holder firmly in place assuring perfect alignment of characters and eliminating danger of slipping.

## Drafting Machine

■ Eugene Dietzgen Co., 2425 Sheffield avenue, Chicago, announces Excello "Free Floating" drafting machine with either standard or civil engineers' protractor head for drawings up to 36 x 60 inches. Machine minimizes drafting fatigue by placing control of angles directly under the thumb without tiresome wrist-twisting. Gravity control eliminates friction brakes and overhang-



ing weights. All moving parts are completely enclosed. Noncontinuous bands with automatic tensioning arrangement eliminate breakage from temperature changes. Machine is finished in nonglaring satin aluminum and black.

## Portable Arc Welder

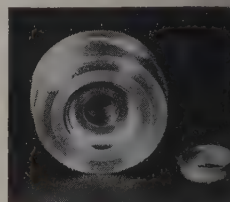
■ Lincoln Electric Co., 12818 Coit road, Cleveland, announces a small motor-generator type arc-welder "SA-150" with self-indicating dual continuous current control. Its current range is 45 to 200 amperes with both job selector and current control calibrated and equipped with dials which indicate type of work and number of amperes for each setting. The slope of volt-ampere



curve and welding curve varied independently. occupies less than four of floor space.

## Carbide Insert for

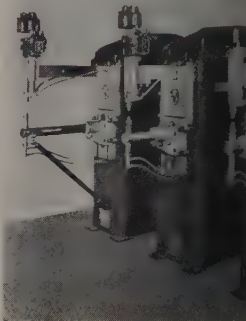
■ McKenna Metals Co., 1001 avenue, Latrobe, Pa., a hard carbide insert for in stamping and drawing may be reground several times. Shown has stamped out



ers without any visible stress. Eighteen standard styles and three of blanks are available.

## Welding Head

■ Progressive Welder Co., 1001 quette avenue, Detroit, welding head employing contact which eliminates connections and uses solenoid connections. This construction mates momentum factor arm and enables operator to "locate" the spot more accurately the path of the welding straight rather than in curves. Braces are available for lower arms when used

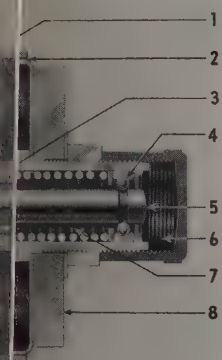




at depth. Tee-slotted permits adjustment for Nonmagnetic head losses and reduces option.

## Key

ries, Inc., Front street ue, Philadelphia, has free-running idler ing of special pulley of cover (2), roller stabilizing ball-bearing (5). Grease cup (6) ed every two years. holds enough grease rs operation. (8) in- ing. At 500 revolu- ute, external load may



ids; thrust, 13 pounds ing shoulder or 6½ opsite direction; at 2500 er minute, respective e 20 pounds radial, 10 s thrust; at 10,000 revo- 13 pounds radial ds thrust either way.

## Grinder

ultz Corp., 2110 Wal- Chicago, has developed nder for heavy work.

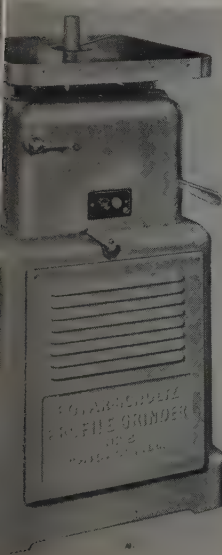
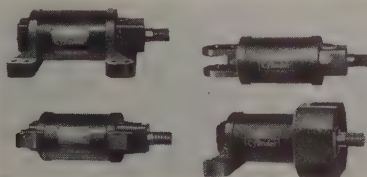


Table has a straight-edge, is drilled with six holes for mounting guide rail or parallel bars and has 4-inch up and down movement. Grinding spindle has 100 3/16 oscillations per minute. T-slot from center to right-hand back corner permits diamond dresser to be left on table. Spindle, driven by a 2-horsepower motor, rotates at approximately 10,000 revolutions per minute. All controls and adjustments are in front.

## High-Pressure Cylinders

■ Hanna Engineering Works, 1765 Elston avenue, Chicago, announces a line of centrifugally cast, mirror-finish high pressure cylinders,



equipped with cushions in both heads to absorb hydraulic shock and any metallic impact in cylinder. Air vent plug is on upper side of cylinder for all port positions. Cylinder attains a minimum in overall dimensions. Piston rods are "chevron" packed. Cylinders are available in 10 distinct types of mounting with diameters ranging from 1½ to 8 inches.

## 50-Ton Hydraulic Jack

■ Rochester Machine Co., Rochester, Pa., has developed a screw-operated 50-ton capacity hydraulic jack with lift of 2¾ inches for use in locations too confined to admit a standard size jack. Minimum space required for lifting-cylinder is 5 inches



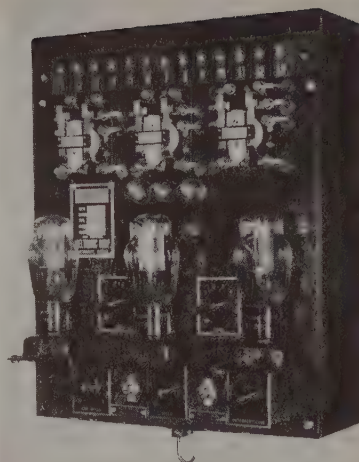
x 6½ inches. Length of extended jack is 2 feet 8 inches.

## Vacuum-Cup Pulley

■ Vacuum Cup Metal Pulley Co., Inc., 12536 Grand River avenue, Detroit, has introduced a line of pulleys with vacuum cups in faces. Cupping action seals belt to pulley, making belt dressing unnecessary and thus eliminating power loss on shock loads, belt slippage and slap, is claim made.

## Welding Timers

■ Weltronic Corp., 731 Piquette street, Detroit, offers electronic welding timers for gun, spot, projec-



tion and automatic welding equipment. Single relay and tube provide full automatic control, opening and closing electrodes periodically. Sections up to ½-inch thick can be handled and speeds up to 600 spot-welds per minute are possible.

## Hold Down

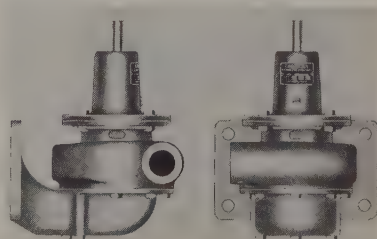
■ Lufkin Rule Co., Saginaw, Mich., offers a hold down for thin work.



Contact edges are tapered and have a clearance step along entire length. Hold down comes in 2, 3, 4, 5, and 6-inch lengths.

## Open Impeller Pumps

■ Pioneer Engineering & Mfg. Co., Inc., 31 Melbourne avenue, Detroit, has put on the market coolant and lubricant pumps of the open impeller type in capacities to 175

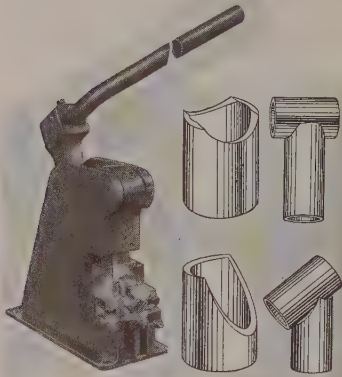


gallons per minute and pressures to 53 pounds per square inch. Higher efficiencies and heads permit use of filters. Shaft seal eliminates necessity of maintaining pump locations in relation to liquid level.

## Tube Shear For Welding

■ Dreis & Krump Mfg. Co., 7400 South Loomis boulevard, Chicago,

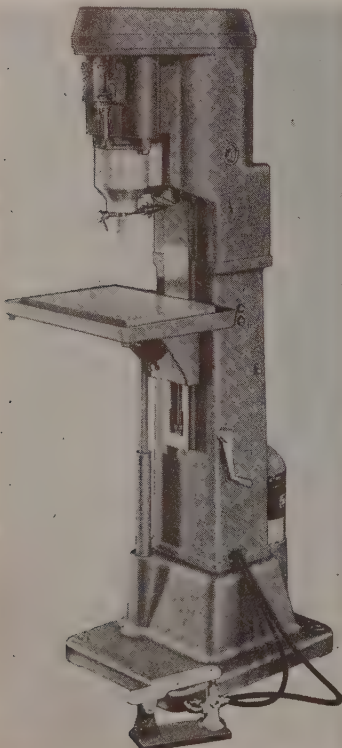
has developed a new arc-fit tool which prepares pipe and tube ends for welded tee joints, bevel joints and double tee connections. First



operation shears one half the arc. Tubing then is rotated 180 degrees and remaining half of arc is sheared, completing tee fit ready to weld. Fits are produced with no distortion.

### Air Controlled Tapper

■ R. G. Haskins Co., 615 So. California avenue, Chicago, announces a tapping machine entirely air controlled for utmost sensitivity, accuracy and speed. Foot pedal unit starts and stops tapping cycle which is controlled by an automatic air valve. This valve controls speed with which tap approaches work and tapping pressure. Machine will



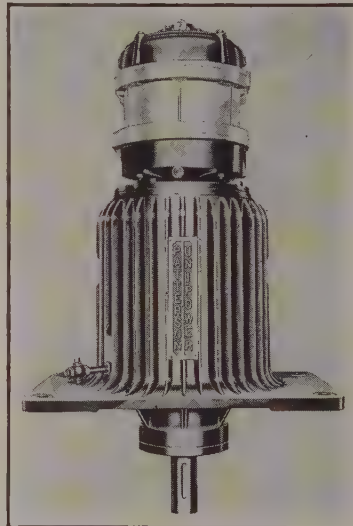
operate in continuous cycles as long as foot pedal is depressed.

### Portable Pyrometer

■ Lewis Engineering Co., Naugatuck, Conn., has introduced a new vibration-proof portable pyrometer for measuring temperature of molten metal. Cold junction is carried inside of instrument case where compensations are made automatically. Scale length is 4½ inches; pistol grip handle and angle-set scale plate permit easy handling. Armored cover-glass decreases possibility of breakage.

### Integral Agitator Drive

■ Patterson Foundry & Machine Co., East Liverpool, O., has redesigned its Unipower ball bearing drive. Bearings are widely spaced permitting a long overhand of mixer shaft without step bearing. Hard-



ened and ground steel gears are of spiral type and are oil lubricated by dual plunger pumps. Lubrication is visible through bull's eyes in case. Prelubricated guide bearing in base eliminates leakage of lubricant into product. Unit is built up to 50 horsepower and various speeds.

### One-Piece Hole Saws

■ Skilsaw, Inc., 3345 Elston avenue, Chicago, has added a line of hole saws made in one piece of 18 per cent tungsten steel, available in diameters from ¼ to 3½ inches. They are used with drills of ½-inch capacity or larger for cutting holes in sheet metals, pipe, cast iron, wood, tile, plaster, marble, bakelite and other composition materials.

### Explosion-Proof Motor

■ Howell Electric Motors Co., Howell, Mich. announces explosion proof motors up to 40 horsepower, carrying the Underwriters' Inspec-

tion Label and approved for Class 1, Group D location of any explosion.



substance within the motor is prevented from reaching the motor.

### Swiss Instruments

■ Park Sales Co., New York, introduces instruments made by a Swiss manufacturer, which include calipers with metric graduations; depth gages, gear calipers, universal protractors, etc. All instruments are made of stainless steel and have a precision of .0001-inch.

### Pneumatic Die

■ Dayton Rogers Machine Co., Minneapolis, Minn., has introduced cushions in five sizes, diameters from 10 to 18 inches for use on presses where tandem dieing is necessary. The dieing pressure when producing is limited.

### Hydraulic-Clutch

■ Cleveland Punch & Die Co., 3917 St. Clair avenue, Cleveland, Ohio, makes a new hydraulic open back press with a bed of 30 x 45 inches, and





# Have You Seen This HELPFUL LITERATURE?

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## Enam Briquettes

Enam Co.—Illustrated booklet No. 315. Enduro stainless steel for manufacture of hospital equipment is described. Characteristics and ability to meet fabricating requirements of this type of equipment are set forth. Numerous pieces of equipment are shown fabricated of Enduro.

## Spinning

Metal Spinning Co.—4-page illustrated bulletin No. S.P.2. The art of metal spinning company, including stainless steel or large articles are described. Forging, annealing, hardening and tempering instructions and characteristics of 5 grades of tool steel are covered.

Valve Div., Manning, Moore, Inc.—4-page illustrated bulletin on "Duravalves". Information on Duravalves, a list of installations, and other engineering installation pictures are included.

## Fans

Avant Co.—20-page illustrated booklet No. 444. "Axiflo" pressure aluminum are said to have mechanical and static efficiency tables of numerous installations are given.

## (5)—Stainless Steel

Republic Steel Corp.—16-page illustrated booklet No. 315. Enduro stainless steel for manufacture of hospital equipment is described. Characteristics and ability to meet fabricating requirements of this type of equipment are set forth. Numerous pieces of equipment are shown fabricated of Enduro.

## (6)—Thermometers

C. J. Tagliabue Mfg. Co.—16-page illustrated catalog No. 1170. Dial-indicating thermometers for industrial applications are fully described. Numerous installations are shown and described. Accessory equipment, standard dials and specifications are included.

## (7)—Metal Stampings

Dayton Rogers Manufacturing Co.—4-page illustrated bulletin. A small lot metal stamping service which does not require expensive dies is described. Typical examples of stampings are shown. Blank sizes up to 20 by 20 inches and 1/4-inch thick can be produced by this method.

## (8)—Air Cylinders

Logansport Machine, Inc.—8-page illustrated bulletin No. 270. Heavy duty mill type cylinders in various sizes and types are described. Dimensional data and cross-sectional diagrams show design and construction. Air cleaners, reducing valve and lubricator and air valves are also covered.

## (9)—Squaring Shears

Niagara Machine & Tool Works—16-page illustrated bulletin No. BL. Power squaring shears with capacity up to 10 gage are fully described. Massive box section bed contributes to strength and rigidity and maintains accuracy of knife setting, and new type back gage provides micrometer accuracy, easy operation and long life.

## (10)—Die Steels

Crucible Steel Company of America — 8-page illustrated folder No. TS201. High carbon, high chromium die steels for special requirements are fully described. Forging, annealing, hardening and tempering instructions and characteristics of 5 grades of tool steel are covered.

## (11)—Wire Rope & Slings

Broderick & Bascom Rope Co.—96-page, pocket-size, illustrated "Riggers' Hand Book". Describes approved methods of handling, splicing and using wire rope and slings. All types of accessories are covered. Engineering data and illustrative instructional sections are included.

## (12)—Tube Expanders

The Gustav Wiedeke Co.—8-page illustrated bulletin No. 65. Illustrates and describes series No. 1500 to No. 2600 ideal self-feed expanders to roll and flare drum, header and water wall tubes in modern steam boilers. Cross-section layout of headers are shown.

Dept.  
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o

JJL  
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Literature I have circled below.

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# HELPFUL LITERATURE

## (13)—Centrifugal Pumps

Worthington Pump and Machinery Corp.—4-page illustrated bulletin No. W-321-B13. Dimensional information and specifications of turbine-driven "Monoblock" centrifugal pumps are given. These units are said to be especially suited for conditions where fire and explosion risk from chemicals, gasoline, dust, oil and gases are present.

## (14)—Gears

Farrell-Cheek Steel Co.—4 page illustrated bulletin on cast tooth gears. The new Farrell-Cheek method of casting gears and pinions is fully explained. Said to offer considerable savings over cut tooth gears, and produce true tooth contour. Especially suitable for gears demanding resistance to strain and wear of teeth.

## (15)—Conveyors

Link-Belt Co.—20-page illustrated book No. 1630. "Link-Belt Overhead Conveyors Make Ceilings Pay Dividends" is the title of this book which shows how various types of overhead conveyors have been applied to numerous materials handling problems in industry.

## (16)—Combustion Control

Leeds & Northrup Co.—32-page illustrated catalog No. N-or-163. "Metermax" combustion control applied to all types of boiler furnaces is described. Schematic diagrams show how this system is applied. Chart records and a photo-diagram show results and operation of the system.

## (17)—Industrial Cranes

The Harnischfeger Corp. — Illustrated bulletin No. C-6. Design and application of P & H cranes for general use are covered. Standard type "H" crane is fully described. Action photos and an illustrated review of crane history are given. Cranes in use in all types of industry are shown.

## (18)—Gears

W. A. Jones Foundry & Machine Co.—224-page illustrated catalog No. 71. This line of cut and molded tooth gears in spur, worm, bevel, mitre and herringbone types, as well as spur, worm and herringbone speed reducers and other power transmission equipment is fully covered in this general catalog. Price list of gears and engineering data are included.

## (19)—Plate Products

National Wrought Iron Annealing Box Co.—24-page illustrated catalog No. 203. Descriptions of made to order and specially engineered annealing boxes, tanks and many types of metal processing equipment and containers fabricated from steel plate are covered. Special engineering service is described.

## (20)—Potentiometer

The Foxboro Co.—4-page illustrated bulletin No. DMF 763. A new portable indicating potentiometer for testing and standardizing service instruments and thermocouples is announced. Full description and schematic drawings of suggested layouts are given.

## (21)—Welding Fittings

Crane Co.—8-page illustrated circular No. 309. Forged steel welding fittings, especially designed for assembly of small size piping installations, are covered. Ease of installation, compactness and strength are features. Dimensional information and tables of strength tests are included.

## (22)—Overhead Conveying

The Cleveland Crane & Engineering Co.—4-page illustrated bulletin No. G1-39. Conservation of human energy by means of overhead conveyor installations is shown by means of numerous typical industrial installations. Loads up to 5 tons can be handled by the systems illustrated.

## (23)—Screw Drivers

The Apex Machine & Tool Co.—12-page illustrated reference and catalog No. 11. Apex bits and hand screw driver bits with recessed head screws, driver bits for slotted heads, illustrated and described bits are given. Special bits are also covered.

## (24)—Hydraulic Cylinders

Hanna Engineering Co.—12-page illustrated catalog. Covers a complete line of hydraulic cylinders. Illustrates various models and dimensions as well as capacity shown. Low pressure control valves are also included.

## (25)—Electric Cable

Anaconda Wire & Cable Co.—12-page illustrated bulletin on "A" cable. This cable without lead sheath is designed for network installations where moisture is present. It is resistant to moisture, flame, action of oils, acids and alkalis and is easily handled in extreme temperatures.

## (26)—Speed Reducers

Allis-Chalmers Manufacturing Co.—4-page illustrated bulletin "Gearmotor" speed reducers. Speed operation are described. Numerous line drawings and photographs show typical applications. A table of ratings and 1750 r.p.m. motors is shown.

## (27)—Riveting Machines

The Tomkins-Johnson Co.—12-page illustrated bulletin No. R-1. The "Rivitor" in the airer is fully described. Illustrations in various operations are given.

## (28)—Bronze

Fredricksen Co. — 10-page illustrated booklet on "Sabco" Bronze made by this process described as having high strength without using "agents". Composition and characteristics of five types available are given.

## STEEL

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speed of 35 strokes  
Press has electri-  
hydraulically-oper-  
clutch and brake.  
instantaneous action  
stripped and may be  
position), after it is  
pressing stop-button.  
capacities can be ob-  
oil pressure on  
is automatically ap-  
is idle and should

## Dryer

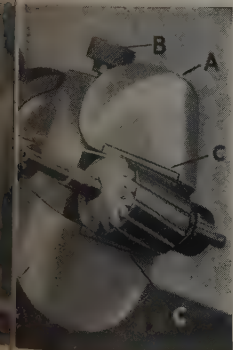
etert Co., 9330 Rose-  
etroit, has developed  
100, for drying pol-  
graphic specimens in



The specimen is  
ashed face up. Heated  
contacts all four faces  
men and thoroughly  
that harming mounting  
polished face. Dryer  
ads.

## Winder

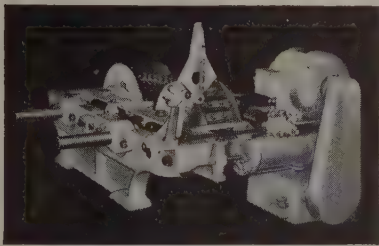
nutator Dresser Co.,  
t, has marketed an  
armature winding head  
universal motor arma-  
3 inches in diameter



with 2 1/4-inch maximum stacking.  
Jaws (C) can be tilted to suit skew  
of slots and are moved back and  
forth by adjusting knob (B). When  
armature is clamped in head, slots  
are held flush with edge of jaws.  
Unit can be mounted on face plate  
of any lathe or turning device.

## Transmission Control

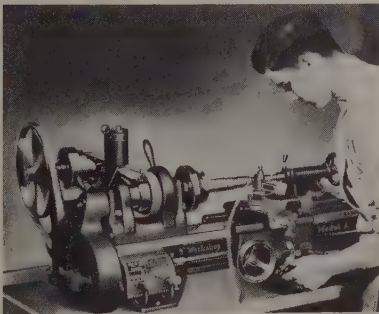
■ Reeves Pulley Co., Columbus,  
Ind., offers hydraulic control for  
Reeves variable-speed transmissions  
to provide automatic regulation,  
making possible synchronization of  
separate units. Pressure of only  
two ounces will change speed. Six



to 20 seconds are required in going  
from minimum to maximum speed.  
Protective mechanism absorbs shock  
of sudden or violent shifting.

## Gear-Type Lathe

■ South Bend Lathe Works, South  
Bend, Ind., has developed a quick-  
change gear type lathe having an  
automatic apron with friction-  
clutch drive for operating power  
cross and longitudinal feeds. Forty-



eight changes are provided for cut-  
ting right and left hand screw  
threads 4 to 224 per inch, and 32  
longitudinal feeds from .0014-inch  
to .0208-inch per revolution of lathe  
spindle. Metric thread cutting equip-  
ment is available. Bed lengths are  
3, 3 1/2, 4 and 4 1/2 feet.

## Boring Mill Set

■ Modern Collet & Machine Co.,  
Ecorse, Mich., offers a complete set  
of boring-mill bars and adaptors  
assembled in box of convenient size  
for work bench. After a boring  
bar has been set to bore a hole, it  
may be removed from holder and



replaced in same position. End  
cutting, side cutting or shear cut-  
ting tools cannot loosen during cut-  
ting. Face-mills up to 8 inches  
served by set, with change features.

## Reversing Motor

■ Sterling Electric Motors Inc., Tel-  
egraph road at Atlantic boulevard,  
Los Angeles, offers a line of squirrel  
cage motors capable of reversing  
once a second at full voltage. As-  
bestos-insulated stator and rotor



windings are cooled with continu-  
ous forced - ventilation from a  
squirrel cage fan driven by a small  
auxiliary motor.

## Saw-Blade Welder

■ Grob Bros., Grafton, Wis., offers  
a butt-welder for saw blades from  
1/16-inch to 1/2-inch wide. Guides  
set teeth of blade outside of clamp,  
which adjusts automatically to



thickness of blade. Welding is entirely automatic. A guarded bakelite grinding wheel for smoothing welds is built into unit.

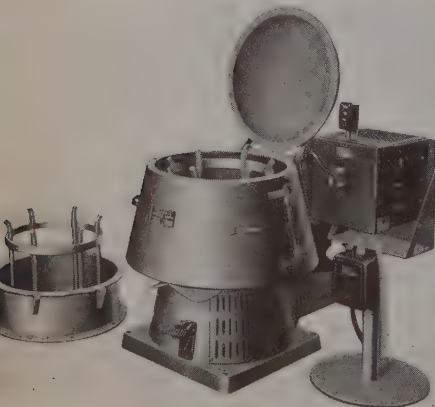
## Platform Jack

■ Yale & Towne Mfg. Co., 4531 Tacony street, Philadelphia, offers a rubber-tired Rollaway jack with semi-live skid platform and oak deck. The handle has an equalizing spring inside the tube which forces it upright when platform is elevated. Prong pocket in front of platform guides the connecting skid to platform and keeps handle at proper angle for easiest insertion. When handle is pulled down the load goes up and is automatically locked in elevated position with handle free. No footwork is necessary to disconnect jack from platform.

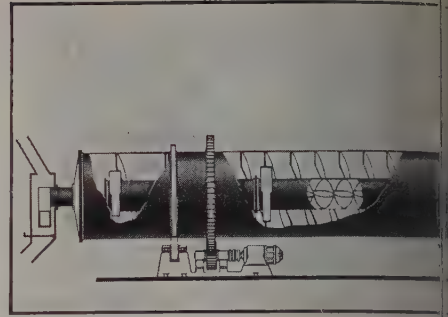


## Centrifugal Galvanizer

■ Tolhurst Centrifugal division, American Machine & Metals, Inc., 100 Sixth avenue New York, has marketed a centrifugal galvanizer for hot tinned and galvanized articles. Threaded pieces, stampings, etc., come free from hangings and lumps. Machine has removable basket and retaining cage which is mounted within the casing. Basket is carried through hot metal bath, placed in galvanizer and rotated. Centrifugal force of turning basket throws off excess spelter, leaving an even layer of metal. Thickness of coating is controlled by acceleration of machine and final speed attained. Motors have variable speed and acceleration, thus all type materials may be processed. Casing has hinged



sides for easy recovery of material thrown out. Galvanizer is available in three sizes, the largest of which will handle pieces up to 24 inches long. Rated load capacity is 100 pounds and 60 to 75 loads per hour are possible.

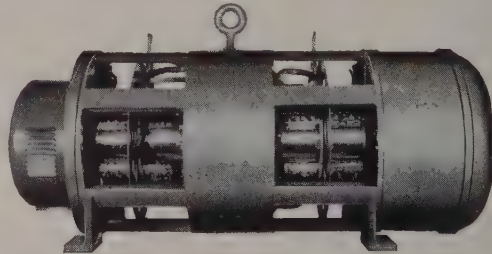


## Utility Drill

■ Van Dorn Electric Tool Co., Towson, Md., offers a 5/16-inch utility ball-bearing drill with a no-load speed of 1100 revolutions per minute and a capacity of 5/16-inch in steel and 3/8-inch in hardwood. A deep-groove ball-bearing on chuck spindle with inner and outer races locked in place absorbs thrust in all directions. This tool has additional chuck capacity.

## Production Plater

■ Hobart Bros. Co., Troy, O., has built a 3000-ampere generator for heavy-duty production plating. Generator can economically handle peak loads as well as light loads. It may be used for retinning, rust-proofing, hard chroming of tools, electro



etching, etc. It will plate most metals, including nickel, brass, bronze, copper and zinc.

## Linestarter

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has non-reversing linestarters for use in across-the-line starting of large squirrel-cage motors and as primary switches for wound-rotor induction motors in four sizes rated from 300 to 1200 amperes. Low voltage protection, hand or automatic reset, saturated current-transformers and magnetic blow-outs are included.

## Rotary Dividing Mixer

■ Patterson Foundry & Machine Co., East Liverpool, O., announces

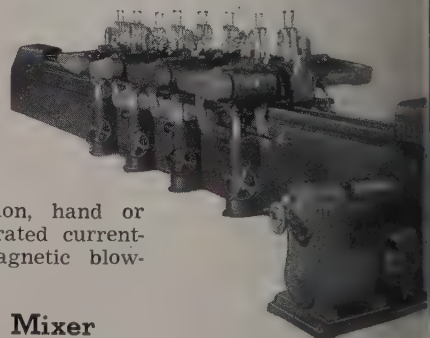
Triplex dry blender in which materials are mixed both by thirds and by conventional cylinders. Material enters single, then a double, then a triple helicoid screw-flows becomes divided into three streams. These continue and recombined until after about 60 revolutions, or almost complete mixing.

## Salt Bath Furnace

■ Twice the electrode low rate of change for materials are claimed for a trode furnace announced by Holden Co., New Haven. Electrodes are arranged in pairs with a current density lower than that of electrodes arranged in pairs. Current is fed from passing and consequent stray-current in wall. Absence of pot life are claimed type of cooling sliding cover for ing and unloading front and side.

## Self-Doping Polisher

■ Hammond Machine Co., Kalamazoo, Mich., has an automatic polishing machine HBH-8, equipped with an applicator for applying to buffing wheels. Polisher handles bars up to 9



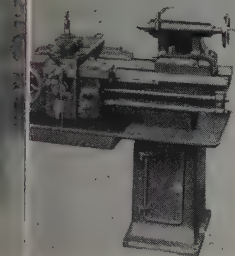
from 2 x 2, to 2 x 6 section. It is operated



and timed to conveyor machine. Polisher will 2-inch round bars. After each application, narrow buffing wheel removes. Speed of table from 14.5 to 70 feet

## ector Lathe

and Machine Tool Co., announces Super sizes 13, 15, 17 and speed selector is built



with dial indicating and cutting speed on. Swing over ways lathe is 13 1/4 inches; 19 1/4 inches. Swing and taper attachment lathe is 8 1/4 inches; 12 inches. Ways are

## ing Hammer

Co., 1441 Chardon road, introduced a drop hammer with a heavy lift-rod. On full stroke "ram cylinder" gives the acceleration or recoil. Blows are struck in succession than if ram down by gravity alone. Mechanism is driven by independent mounted on a spring platform. Ram in elevation is released by a light button. Steel base weighs

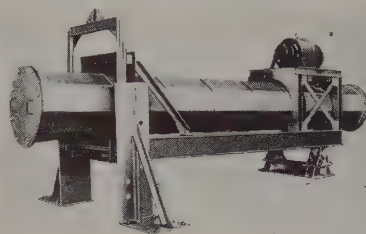


twenty times the ram weight. Hammers are available in standard sizes from 1500 to 6500 pounds, and larger on request.

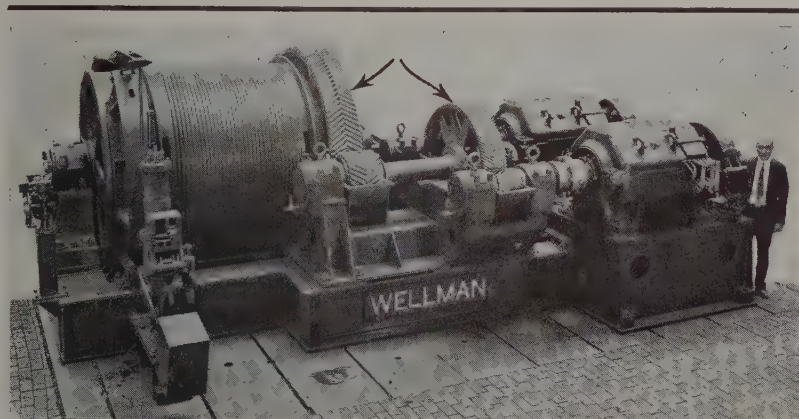
## Rotary Cleaner

■ Sutton Engineering Co., Bellefonte, Pa., announces the Hilbish-McCahan rotary cleaner for removing rust and loose scale from hot-rolled bars and structural shapes up to 12 inches wide and plates up to 24 inches wide. In same operation machine also coats or paints sections up to 25 feet long. Lengths of 40 feet also may be cleaned, but coating or paint must be applied by brush or spray. The coating, an oil

base, is applied under pressure and is suitable as shop or prime coat.



It is reported that during a recent test the machine took 55 minutes to remove rust and scale and apply paint to 14,000 feet of 1 x 3/16 flats.



Farrel-Sykes Herringbone Gears are used in this single drum, double-motor-driven Blast Furnace Skip Hoist, built by the Wellman Engineering Co., Cleveland.

# FARREL-SYKES GEARS Aid the Performance of this Wellman Skip Hoist

When the Wellman Engineering Company wanted long-wearing, dependable gears for this skip hoist, they selected Farrel-Sykes continuous tooth herringbone gears.

For these gears give never-failing performance under the severest operating conditions and they are exceptionally quiet and smooth-running.

These qualities are derived from their rugged construction, from the extra strength and load-carrying capacity of continuous herringbone teeth, from the ac-

curacy of tooth generation by the famous Sykes process, from the selection of the right materials and from numerous other factors which long experience, engineering resourcefulness and unusual plant facilities enable us to combine and apply to the correct solution of gear drive problems.

Farrel-Sykes Gears and Gear Units are made in any capacity up to 10,000 H.P., for every type of service. A series of standard units offers a wide range of types and sizes for diverse operating conditions. Special units built to order.

Consult our engineers on your gear problems



**FARREL-BIRMINGHAM COMPANY, Inc.**

322 VULCAN STREET - - - - - BUFFALO, N. Y.

*The Gear with a Backbone*

## New Melt Shop

(Concluded from Page 52)

The heat is tapped into a single large ladle which is carried over ingot molds by a 75-ton ladle crane. Ingot molds are of 3000-pound size, thus running about '36-38 heat.

An emergency platform, enclosed except for regularly spaced doors, is built the full length of the side of the melt shop on which the pouring floor is located, at a height level with the cab on the ladle crane. This is a safety precaution so that in event of fire or accident, the crane operator can step out of his cab quickly

and descend a fire escape to the ground.

After ingots are poured they are moved by locomotive out one end of the building and around a track into the stripping building, a 280 by 70-foot structure which adjoins the stockhouse. Ingot molds are lifted off and the steel then follows through the usual procedure of heating and rolling.

With furnace charges running 100 per cent scrap, a large amount of the latter must be kept on hand. Previously the bulk of this material has been stored outdoors, but with recent improvements to facilities, it

is planned to store at least 100,000 tons of steel under cover in the stockpile, though undoubtedly the stockpile will continue to be maintained outside of the building proper.

Installation of the new melting furnace was planned with provision for small heats of steels of different grades. Actually a third still smaller unit will be added to produce alloy steels made in quantities measured in pounds rather than tons.

## Chloride Electroplating For Nickel-Plating

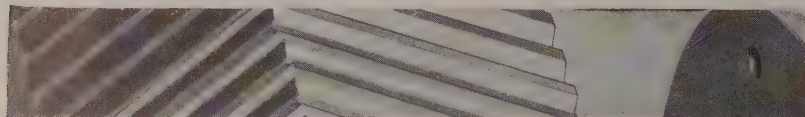
■ According to Dr. W. H. and Mr. J. W. Carey, Nickel Co., 67 Wall Street, New York, who read a paper on "Electrodeposition of Nickel Chloride Solutions," at the seventy-fifth general meeting of the Electrochemical Society, a finer-grained nickel can be obtained by using a chloride-boric-acid solution instead of the usual sulfate. Lower tendency to form dendrites and built-up edges, a 50 per cent reduction in power consumption, a wide plating range at anode and cathode, lower susceptibility to poisoning, easier buffing of coated surfaces are advantages claimed. Principal advantages of the chloride process are its greater corrosiveness, which can be overcome by use of special equipment, and the low cost of deposits.

## Industry Needs Sales Technically Trained Men

■ "On all three sides of the industrial triangle—production, sales and management—technically trained men are becoming increasingly important," declared Girdler, chairman, Republic Steel Corp., before a dinner at the Case School of Applied Science, Cleveland, May 1.

The engineer is not only the figure on the production side, he is rapidly emerging as the figure on the sales side.

"Today, more than ever, more attention is being paid to the customer and the customer's problems. More than ever, salesmen are interested in the prospect of profitable customers as well as for the sale. That requires a sales force thoroughly familiar with the processing problems of the customer and able to resolve the problems."



# SMOOTH POWER



● Where speeds are high . . . where smooth operation is required . . . where quietness is a factor, Horsburgh & Scott Herringbone Gears and Speed Reducers are ideal. Gears are Sykes type . . . accurate . . . and with a continuous, double helical tooth . . . giving increased bearing surface . . . greater resistance to wear. They provide the most economical . . . the smoothest known means of transmitting power between parallel shafts.

*Send for our complete 448 page Catalog.*

## THE HORSBURGH & SCOTT CO.

### GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.



## Machinery

(Continued from Page 58)

and fixtures used in plant. The jigs or most part, are used to hold the parts in contact with one another, tack welds are applied to hold the assembly then is taken to the booth and complete welding so be made in a down position. This permits full use of the high efficiencies and welding modern heavily coated

is an excellent example of the way welding is used to produce all types of unusual fabrications in this plant.

### Welds Sandblasted

Welds are not ground off or finished in any manner. They are, however, carefully sand or shot blasted to remove completely the slag layer deposited by the heavily coated electrodes during finish welding. All blasting is handled in a special booth. The work is suspended from a monorail which extends lengthwise the building. All welding lines are crosswise the building and so feed into this monorail line going through the blasting

booth, which then carries it to the assembly lines, also extending crosswise the building.

Sandblasting is done for two reasons; it permits the welds to be examined carefully for workmanship and complete fusion. It also assures that the paint applied during finishing will not come off when the equipment gets out in the field. By assuring complete removal of the slag covering, it prevents paint defects from developing in use. Paint is applied directly over the blasted work with no attempt to smooth out the welds, the uniform ripple usually found indicating the excellence of the weld itself.

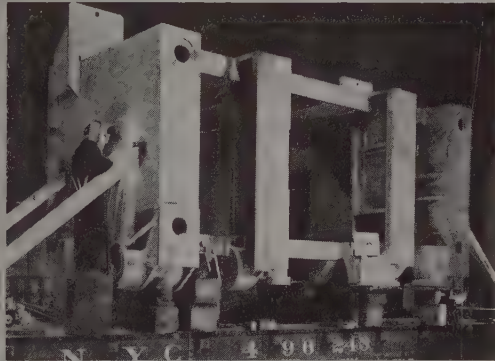
## YOU'LL SAVE ON WELDING COSTS USING MUREX FOR SUCH JOBS

The cost of electrodes used is a very minor part of the cost of any welded structure. But, the choice of electrodes can be a major factor.

When Murex Electrodes go on the job, welding costs go down because their ease of handling and speed of operation save time and increase production.

Ask to have the Murex representative in your territory call and show you this outstanding feature of these cost-cutting electrodes. At the same time, make use of his experience in shop practice, production methods, and welding procedure. Let him help solve your welding problems. No obligation is involved.

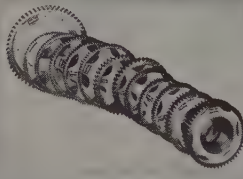
Write, also, for the pocket-size Murex pamphlet giving applications, physical properties, etc., for each electrode in the Murex line.



1 You can make real savings with Murex in fabricating heavy work such as this 10,000 lb. prestressed concrete bridge girder. Users report 10% to 30% less welding time on fillet and dovetail work. Photo courtesy Taylor-Winfield Corp., Detroit, Mich.



2 No need to worry about strength, soundness or ductility of Murex welds. Murex provides electrodes to meet every possible requirement along these lines. Photo of Murex-welded shovel courtesy The Osgood Company, Marion, O.



3 In making welded gears—a mass production operation—Murex steps up work: insures clean, good looking welds. Photo courtesy Shaw Box Crane & Hoist Company, Muskegon, Mich.



4 For welds subject to high pressures and temperatures, two separate Murex rods assure rapid deposition of just the right type of weld metal. Photo courtesy Columbian Steel Tank Co., Kansas City, Mo.



5 Used at higher amperages, Murex Electrodes speed welding and keep down costs—important in rush work, even more than on regular schedules. Photo of welded snow plow courtesy Carl H. Friel, Mfr., Clayton, N. Y.

**MUREX**  
HEAVY COATED  
**ELECTRODES**

METAL & THERMIT CORPORATION  
120 Broadway, New York, N. Y.  
Albany • Chicago • Pittsburgh • San Francisco • Toronto

## Barrels And Drums

(Concluded from Page 47)

3 can be seen the motor and drive used to revolve drums while they are in the paint machine.

Typical of the special handling units developed in connection with drum and barrel manufacture is the upsetter shown in Fig. 4. Here the drums, when completely painted, come down from the drying oven to loading or storage areas on the first floor of the plant. Drums are handled on their sides throughout all painting and drying operations, but it is desired to have them delivered on end on the gravity roller conveyors here. To do this, a device is provided onto which the drum automatically is discharged from the conveyor tray. One end of this platform is hinged, and the other end is connected to an accurately timed mechanism, synchronized with the vertical conveyor to lift the drum up on end and deposit it onto the gravity roller conveyor. This operation is entirely automatic for any speed at which the vertical elevator unit may operate. Also in this view, Fig. 4, can be seen eccentric connecting rods going to the automatic feed unit, which loads drums from the painting station to the oven entrance side of the vertical conveyor on the second floor.

Another special handling device developed for certain applications is called the quarter-turn unit. In many plants it is not possible to have conveyors in line, so this special unit swings drums in the horizontal position around any arc desired. In some places it is desirable to have equipment which

will take a drum on end and lay it on its side, so another special unit has been developed to do this. All such equipment is designed to be synchronized with the remainder of the handling equipment to form a continuous handling system.

## Automatic Finishing

(Concluded from Page 55)

electrical heating units which are controlled automatically by thermostats. It will be noted that provision is made for 8 lengths of strip outside of the oven. When strip is passed through this part of the setup, it is given an opportunity to cool down from the oven temperature to near room temperature before being coiled on the reel.

The arrangement shown in Fig. 2 of course requires less floor space than the first setup shown in Fig. 1 since the oven is arranged vertically and thus is a more compact unit. The equipment in Fig. 2 also is arranged for continuous operation as the ends of the coils are fastened together before entering the machine so the equipment may operate continuously. Also, the finished coils are removed on the rewind end without stopping the machine. A number of electric motors are employed throughout the arrangement to furnish the driving power required. Since a small amount of power is required, however, little difficulty is encountered in synchronizing these operations. One attendant is all that is required to operate this equipment as it is only necessary to join ends of entering coils and remove finished

coils at the rewind end. A supply of enamel comes from a reservoir which replenishes at long intervals.

The slat-forming machine in Fig. 3 has a number of features. First, it is automatic in its operation, it will continue to produce a high rate of speed until the coil is reached of the specified number have

This machine automatically and punches any number of slats, the length may vary from 8 inches. Also, any number of slots or slots to accommodate cords may be punched.

Cutting and punching are performed while the motion. Preloaded electric are employed for these. The electric control is centered in the case side of the forming rolls in

## Forms Slat Continues

This machine is capable of producing a sufficient number for the average size V in a total of 70 seconds. pares with approximately utes required to fabricate a wood blind of the same the cutting off and punching are performed on possible to form the slats at a speed corresponding to a speed of 90 feet a minute, which is a high speed of the forming

Already a number of concerns are studying the application of this equipment to particular products as finishing and fabricating such as described here have an extremely wide application. A wide range of steel moldings and corner well as ornamental strip types may shortly be produced at extremely high rates of equipment such as described. There appears little doubt of the development of this equipment to affect the manufacture of articles made from strip sl is quite possible that it will find the application of strip in many fields where so far been a competitive material.

## Publications Available

■ "Electrodeposition of Alkaline Solutions" published number 82, "The Nickel and Plating of Tinplate" number A-79, "Flux in Hot-Dipped Tin Coating" number 80 and "Electrodeposition of Tin from Acid Solutions II" are available in form from International Research and Development, 149 Broadway, New York

# "HERCULES"


RED-STRAND

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**Furnished in Flattened Strand, Round Strand, Preformed, Steel Clad and Non-Rotating constructions.**

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# Decline In Activity Partially Arrested

## Interruption Seen Only Temporary; Pig Iron Production Down

The arrest of the decline in finished steel does not lead to hope of a definite reversal in the recent trend. At the same time supportive previous expectations that the spring business will be gradual.

Indications of the coal mining suspension, steel production also has tended to level off. National steelmaking last week was unchanged in output, following five successive weekly rises. This compares with 31 per cent a year ago. The winding coal reserves has been more apparent in blast furnace operations than in steel output. Twenty-two stacks were shut down in April, and then banked, as pig iron production dropped below the March daily rate. The decline in pig iron output last month was less than 10 per cent. Steel plants generally are several weeks removed from the point where fuel scarcity will cause any interruption of operations, but measures to conserve fuel continue in effect.

April average pig iron production in April was 77,201 tons compared with 77,201 tons in March and 77,201 tons in April, 1938. Steel assemblies, which three weeks ago set a new peak, last week declined sharply to the lowest level for the year to date. The letdown was in view of the previous reduction in parts and tooling. With dealer stocks ample in relation to buying, assemblies appear unlikely to show an upward trend before late summer. Production of more than 15,000 units last week was general. General Motors current production 35,005 to 27,260; Ford from 21,460 to 16,000; Chrysler from 19,325 to 17,590 and all others from 8,800 to 8,670.

### Steel Orders Entered

### New Model Automobiles

Steel orders have been placed for 1940 model automobiles; additional tonnage is looked for within a few weeks. Whether or not such business will bring about the hoped-for revival in total steel demand for the mid-year will depend on how well activity in other consumers is sustained. Price weakness is evident in automotive buying of flat-rolled prod-

ucts but appears to have been fairly well localized.

Mill backlogs of rails and fastenings are declining. Great Northern has ordered 10,000 tons of rails, with only a few additional roads remaining as prospective buyers.

A small flurry has appeared in railroad equipment buying. Maine Central has awarded 300 gondolas, and the Denver & Rio Grande Western has placed 650 freight cars. The Santa Fe has bought 30 diesel switch engines and one diesel passenger locomotive.

April freight car awards of 3095 brought the total so far this year to 6175. While this is a sharp gain over the 829 placed in the 1938 period, it is below expectations and compares with 40,705 the first four months of 1937 and 14,009 in 1936.

### Tin Plate Output Expands Seasonally To 70 Per Cent

Tin plate demand and production continue to expand seasonally, constituting one of the brighter spots of the market. Output advanced 5 points last week to 70 per cent, best rate for 1939 to date and comparing with 55 a year ago.

Gains in building construction are reflected in demand for various steel products. Stimulus provided new business in structural shapes and concrete reinforcing bars by public projects appears to have reached its peak for the year, although shipments will continue active for several months. Shipbuilding and government armament purchases also promise to be supporting factors for an extended period.

Steelmaking declined in only three districts last week. Chicago was off 2½ points to 47 per cent, eastern Pennsylvania 1 point to 36 and Buffalo 2½ to 35. Offsetting this loss were gains of 1 point to 44 at Pittsburgh, 1 point to 64 at Wheeling, 5½ points to 44½ at Cleveland and 9 points to 51 at St. Louis. Unchanged areas were Birmingham at 55, Youngstown at 43, Detroit at 59, Cincinnati at 52 and New England at 45.

Scrap markets continue influenced by slow demand, and the composite is off 8 cents to a six-months' low at \$14.12. The finished steel composite is unchanged at \$56.50.

## MARKET IN TABLOID ★

### Demand

Letdown more gradual; tin plate quickens.

### Prices

Flat-rolled weakens; scrap lowest in six months.

### Production

Unchanged at 49 per cent.

# COMPOSITE MARKET AVERAGES

	May 6	Apr. 29	Apr. 22	One Month Ago Apr., 1939	Three Months Ago Feb., 1939	One Year Ago May, 1938
Iron and Steel ....	\$36.21	\$36.26	\$36.29	\$36.34	\$36.37	\$38.50
Finished Steel ....	56.50	56.50	56.50	56.50	56.50	61.70
Steelworks Scrap..	14.12	14.21	14.46	14.64	14.87	11.47

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shape pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

## COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and (n

Finished Material	May 6, 1939	April 1939	Feb. 1939	May 1938	Pig Iron	May 6, 1939	April 1939
Steel bars, Pittsburgh .....	2.25c	2.25c	2.25c	2.45c	Bessemer, del. Pittsburgh .....	\$22.34	\$22.34
Steel bars, Chicago .....	2.25	2.25	2.25	2.50	Basic, Valley .....	20.50	20.50
Steel bars, Philadelphia .....	2.57	2.57	2.57	2.77	Basic, eastern, del. Philadelphia .....	22.34	22.34
Iron bars, Terre Haute, Ind. ....	2.15	2.15	2.15	2.35	No. 2 foundry, Pittsburgh .....	22.21	22.21
Shapes, Pittsburgh .....	2.10	2.10	2.10	2.25	No. 2 foundry, Chicago .....	21.00	21.00
Shapes, Philadelphia .....	2.215	2.215	2.215	2.465	Southern No. 2, Birmingham .....	17.38	17.38
Shapes, Chicago .....	2.10	2.10	2.10	2.30	Southern No. 2, del. Cincinnati .....	20.89	20.89
Plates, Pittsburgh .....	2.10	2.10	2.10	2.25	No. 2X, del. Phila. (differ. av.) ..	23.215	23.215
Plates, Philadelphia .....	2.15	2.15	2.15	2.445	Malleable, Valley .....	21.00	21.00
Plates, Chicago .....	2.10	2.10	2.10	2.30	Malleable, Chicago .....	21.00	21.00
Sheets, hot-rolled, Pittsburgh .....	2.15	2.15	2.15	2.40	Lake Sup., charcoal, del. Chicago .....	28.34	28.34
Sheets, cold-rolled, Pittsburgh .....	3.20	3.20	3.20	3.45	Gray forge, del. Pittsburgh .....	21.17	21.17
Sheets, No. 24, galv., Pittsburgh ..	3.50	3.50	3.50	3.80	Ferromanganese, del. Pittsburgh ..	85.33	85.33
Sheets, hot-rolled, Gary .....	2.15	2.15	2.15	2.50			
Sheets, cold-rolled, Gary .....	3.20	3.20	3.20	3.25			
Sheets, No. 24, galv., Gary .....	3.50	3.50	3.50	3.90			
Bright bess., basic wire, Pitts. ....	2.60	2.60	2.60	2.90			
Tin plate, per base box, Pitts. ....	\$5.00	\$5.00	\$5.00	\$5.35			
Wire nails, Pittsburgh .....	2.45	2.45	2.45	2.75			

### Semifinished Material

Sheet bars, Pittsburgh, Chicago..	\$34.00	\$34.00	\$34.00	\$37.00
Slabs, Pittsburgh, Chicago .....	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh .....	34.00	34.00	34.00	37.00
Wire rods, No. 5 to 3/2-inch, Pitts.	43.00	43.00	43.00	47.00

### Scrap

Heavy melting steel, Pittsburgh ..	\$14.75	\$15.50
Heavy melt. steel, No. 2, E. Pa. ....	12.75	13.63
Heavy melting steel, Chicago .....	12.75	13.35
Rails for rolling, Chicago .....	17.25	17.25
Railroad steel specialties, Chicago ..	14.75	15.35

### Coke

Connellsville, furnace, ovens. ....	\$3.75	\$3.75
Connellsville, foundry ovens. ....	5.00	5.00
Chicago, by-product fdry., del. ....	10.50	10.50

## STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

*Except when otherwise designated, prices are base, f.o.b. cars.*

### Sheet Steel

#### Hot Rolled

Pittsburgh .....	2.15c
Chicago, Gary .....	2.15c
Cleveland .....	2.15c
Detroit, del. ....	2.25c
Buffalo .....	2.15c
Sparrows Point, Md. ....	2.15c
New York, del. ....	2.39c
Philadelphia, del. ....	2.32c
Granite City, Ill. ....	2.25c
Middletown, O. ....	2.15c
Youngstown, O. ....	2.15c
Birmingham .....	2.15c
Pacific Coast points .....	2.65c

#### Cold Rolled

Pittsburgh .....	3.20c
Chicago, Gary .....	3.20c
Buffalo .....	3.20c
Cleveland .....	3.20c
Detroit, delivered .....	3.30c
Philadelphia, del. ....	3.52c
New York, del. ....	3.54c
Granite City, Ill. ....	3.30c
Middletown, O. ....	3.20c
Youngstown, O. ....	3.20c
Pacific Coast points .....	3.80c

#### Galvanized No. 24

Pittsburgh .....	3.50c
Chicago, Gary .....	3.50c
Buffalo .....	3.50c
Sparrows Point, Md. ....	3.50c
Philadelphia, del. ....	3.67c
New York, delivered .....	3.74c
Birmingham .....	3.50c

Granite City, Ill. ....	3.60c
Middletown, O. ....	3.50c
Youngstown, O. ....	3.50c
Pacific Coast points .....	4.00c

<b>Black Plate, No. 29 and Lighter</b>	
Pittsburgh .....	3.05c
Chicago, Gary .....	3.05c
Granite City, Ill. ....	3.15c
<b>Long Ternes No. 24 Unassorted</b>	
Pittsburgh, Gary .....	3.95c
Pacific Coast .....	4.65c

#### Enameling Sheets

	No. 10	No. 20
Pittsburgh .....	2.75c	3.35c
Chicago, Gary .....	2.75c	3.35c
Granite City, Ill. ....	2.85c	3.45c
Youngstown, O. ....	2.75c	3.35c
Cleveland .....	2.75c	3.35c
Middletown, O. ....	2.75c	3.35c
Pacific Coast .....	3.35c	3.95c

### Corrosion and Heat-Resistant Alloys

*Pittsburgh base, cents per lb.*

#### Chrome-Nickel

	No. 302	No. 304
Bars .....	24.00	25.00
Plates .....	27.00	29.00
Sheets .....	34.00	36.00
Hot strip .....	21.50	23.50
Cold strip .....	28.00	30.00

#### Straight Chromes

	No.	No.	No.
	410	430	442
Bars .....	18.50	19.00	22.50
			27.50

Plates ..	21.50	22.00	25.50	30.50
Sheets ..	26.50	29.00	32.50	36.50
Hot strip ..	17.00	17.50	23.00	28.00
Cold stp. ....	22.00	22.50	28.50	36.50

### Steel Plate

Pittsburgh .....	2.10c
New York, del. ....	2.29c
Philadelphia, del. ....	2.15c
Boston, delivered .....	2.42c
Buffalo, delivered .....	2.33c
Chicago or Gary .....	2.10c
Cleveland .....	2.10c
Birmingham .....	2.10c
Coatesville, base .....	2.10c
Sparrows Point, base .....	2.10c
Claymont, del. ....	2.10c
Youngstown .....	2.10c
Gulf ports .....	2.45c
Pacific Coast points .....	2.60c

#### Steel Floor Plates

Chicago .....	3.35c
Gulf ports .....	3.70c
Pacific Coast ports .....	3.95c
Pittsburgh .....	3.35c

### Standard Shapes

Pittsburgh .....	2.10c
Philadelphia, del. ....	2.21 1/2c
New York, del. ....	2.27c
Boston, delivered .....	2.41c
Bethlehem .....	2.10c
Chicago .....	2.10c
Cleveland, del. ....	2.30c

### Tin and Ter

<b>Tin Plate, Coke</b>	
Pittsburgh, Gary, C. ....	
Granite City, Ill. ....	
<b>Mfg. Terne Plate</b>	
Pittsburgh, Gary, C. ....	
Granite City, Ill. ....	

### Bars

<b>Soft Ste</b>	
(Base, 3 to 2	
Pittsburgh .....	
Chicago or Gary .....	
Duluth .....	
Birmingham .....	
Cleveland .....	
Buffalo .....	
Detroit, delivered .....	
Philadelphia, del. ....	
Boston, delivered .....	
New York, del. ....	
Gulf ports .....	
Pacific Coast points .....	

#### Rail Stee

(Base, 15 to 5	
Pittsburgh .....	
Chicago or Gary .....	
Detroit, delivered .....	
Cleveland .....	



—The Market Week—

.....	2.10c
.....	2.10c
.....	2.45c
.....	2.70c
.....	2.15c
.....	2.47c
.....	3.50-8.00c
.....	2.05c
.....	2.15c
.....	2.40c
.....	2.50c
.....	2.22c
.....	1.90c
.....	2.00c
.....	2.25c
.....	2.35c

.....	3.15c
.....	3.40c
.....	2.62
.....	2.95c
.....	3.35c
.....	67.00
.....	56.00
.....	2.60c
.....	2.65c
.....	3.20c
.....	\$2 higher on
.....	and spring wire.

Carbon	Alloy
2.70c	3.40c
2.70c	3.40c
2.70c	3.40c
2.75c	*3.50c
2.70c	3.40c
2.70c	3.40c

.....	2.80c
.....	2.90c
.....	1.10
.....	0.45
.....	0.15
.....	1.20
.....	0.85
.....	1.50
.....	0.85
.....	0.15
.....	0.40
.....	up 50 cents.

## Strip and Hoops

(Base, hot-rolled, 1 to 20 tons;  
cold-rolled, 3 to 25 tons)

<b>Hot Strip, 12-inch and less</b>	
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Youngs, Pitts., Chicago, Birm.	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.15c
Carbon	Cleve., Pitts.
0.26—0.50	2.95c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c
Worcester, Mass \$4 higher.	
<b>Commodity Cold-Rolled Strip</b>	
Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c
Lamp stock up 10 cents.	

## Rails, Fastenings

<b>(Gross Tons)</b>	
Standard rails, mill.	\$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	\$40.00
Do., rerolling quality.	39.00
<b>Cents per pound</b>	
Angle bars, billet, mills.	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham.	3.15c
Tie plates, base	2.15c
Base, light rails 25 to 60 lbs., 20 lbs., up \$2; 16 lbs. up \$4; 12 lbs. up \$8; 8 lbs. up \$10. Base railroad spikes 200 kegs or more; base plates 20 tons.	

## Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

<b>Carriage and Machine</b>	
1/2 x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1 1/2 and larger	64 off
Tire bolts	52.5 off

<b>Stove Bolts</b>	
In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12% off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.	
Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

<b>Nuts</b>	
Semifinished hex. U.S.S. S.A.E.	
6-inch and less.	67 70
3/4-1-inch	64 65
1 1/2 and larger.	62 62

<b>Hexagon Cap Screws</b>	
Upset, 1-in., smaller	67.5 off

<b>Square Head Set Screws</b>	
Upset, 1-in., smaller	75.0 off
Headless set screws	70.0 off

## Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

## Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
1/4-inch and smaller,	

Pitts., Chi., Cleve. . . . 65-10 off  
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. \$5.40; c.l. \$5.75 off

## Welded Iron. Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2 1/2 and 1 1/2 less, respectively. Wrought pipe, Pittsburgh base.

<b>Butt Weld</b>	
<b>Steel</b>	
In.	Blk. Galv.
1/2	63 1/2 54
3/4	66 1/2 58
1-3	68 1/2 60 1/2
<b>Iron</b>	
1/2	30 13
1-1 1/2	34 19
1 1/2	38 21 1/2
2	37 1/2 21

<b>Lap Weld</b>	
<b>Steel</b>	
2	61 52 1/2
2 1/2-3	64 55 1/2
3 1/2-6	66 57 1/2
7 and 8	65 55 1/2
9 and 10	64 1/2 55
11 and 12	63 1/2 54
<b>Iron</b>	
2	30 1/2 15
2 1/2-3 1/2	31 1/2 17 1/2
4	33 1/2 21
4 1/2-8	32 1/2 20
9-12	28 1/2 15

<b>Line Pipe</b>	
<b>Steel</b>	
1 to 3, butt weld	67 1/2
2, lap weld	60
2 1/2 to 3, lap weld	63
3 1/2 to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63 1/2
12-inch, lap weld	62 1/2
<b>Iron</b>	
1/2 butt weld	25 7
1 and 1 1/2 butt weld	29 13
1 1/2 butt weld	33 15 1/2
2 butt weld	32 1/2 15
1 1/2 lap weld	23 1/2 7
2 lap weld	25 1/2 9
2 1/2 to 3 1/2 lap weld	26 1/2 11 1/2
4 lap weld	28 1/2 15
4 1/2 to 8 lap weld	27 1/2 14
9 to 12 lap weld	23 1/2 9

## Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

<b>Lap Welded</b>	
<b>Sizes</b>	
1 1/2" O.D.	13 \$ 9.72
1" O.D.	13 11.06
2" O.D.	13 12.38
2 1/2" O.D.	13 13.79
2 1/2" O.D.	12 15.16
2 1/2" O.D.	12 16.58
2 1/2" O.D.	12 17.54
3" O.D.	12 18.35
3 1/2" O.D.	11 23.15
4" O.D.	10 28.66
5" O.D.	9 44.25
6" O.D.	7 68.14
<b>Seamless</b>	
<b>Sizes</b>	
1" O.D.	13 \$ 7.82
1 1/2" O.D.	13 9.26
1 1/2" O.D.	13 10.23
1 1/2" O.D.	13 11.64

2" O.D.	13	13.04	15.03
2 1/2" O.D.	13	14.54	16.76
2 1/2" O.D.	12	16.01	18.45
2 1/2" O.D.	12	17.54	20.21
2 1/2" O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3 1/2" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4 1/2" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

## Cast Iron Pipe

<b>Class B Pipe—Per Net Ton</b>	
6-in., & over, Birm.	\$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00
<b>Class A Pipe \$3 over Class B</b>	
Std. ftgs., Birm., base \$100.00	

## Semifinished Steel

<b>Rerolling Billets, Slabs</b>	
<b>(Gross Tons)</b>	
Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young, Birm., Sparrows Point.	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

<b>Forging Quality Billets</b>	
Pitts., Chi., Gary, Cleve., Young, Buffalo, Birm.	40.00
Duluth	42.00

<b>Sheet Bars</b>	
Pitts., Cleveland, Young, Sparrows Point, Buffalo, Canton, Chicago.	34.00
Detroit, delivered	36.00

<b>Wire Rods</b>	
Pitts., Cleveland, Chicago, Birmingham No. 5 to 3 1/2-inch incl.	43.00
Do., over 3 1/2 to 1 1/2-in. incl.	48.00
Worcester up \$2; Galveston up \$6; Pacific Coast up \$9.	

<b>Skelp</b>	
Pitts., Chi., Young, Buff., Coatesville, Sparrows Pt.	1.90c

## Coke

<b>Price Per Net Ton</b>	
<b>Beehive Ovens</b>	
Connellsville, fur.	\$3.75
Connellsville, fdry.	4.75-5.50
Connell, prem. fdry.	5.75-6.25
New River fdry.	6.50-6.75
Wise county fdry.	5.50-5.75
Wise county fur.	4.50-4.75

<b>By-Product Foundry</b>	
Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens.	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens.	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

## Coke By-Products

<b>Spot, gal., freight allowed east of Omaha</b>	
Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c
<b>Per lb. f.o.b. Frankford and St. Louis</b>	
Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c
<b>Eastern Plants, per lb.</b>	
Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	\$28.00

## Pig Iron

Delivered prices include switching charges only as noted.  
No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above  
2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malle- able	Basic	Besse- mer
Bethlehem, Pa. ....	\$22.00	\$22.50	\$21.50	\$23.00
Birdsboro, Pa. ....	22.00	22.50	21.50	23.00
Birmingham, Ala.† .....	17.38	.....	16.38	22.00
Buffalo .....	21.00	21.50	20.00	22.00
Chicago .....	21.00	21.00	20.50	21.50
Cleveland .....	21.00	21.00	20.50	21.50
Detroit .....	21.00	21.00	20.50	21.50
Duluth .....	21.50	21.50	.....	22.00
Erie, Pa. ....	21.00	21.50	20.50	22.00
Everett, Mass. ....	22.00	22.50	21.50	23.00
Granite City, Ill. ....	21.00	21.00	20.50	21.50
Hamilton, O. ....	21.00	21.00	20.50	.....
Neville Island, Pa. ....	21.00	21.00	20.50	21.50
Provo, Utah .....	19.00	.....	.....	.....
Sharpsville, Pa. ....	21.00	21.00	20.50	21.50
Sparrow's Point, Md. ....	22.00	.....	21.50	.....
Swedeland, Pa. ....	22.00	22.50	21.50	23.00
Toledo, O. ....	21.00	21.00	20.50	21.50
Youngstown, O. ....	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

**Delivered from Basing Points:**

Akron, O., from Cleveland.....	22.39	22.39	21.89	22.89
Baltimore from Birmingham.....	22.78	.....	21.66	.....
Boston from Birmingham.....	22.12	.....	.....	.....
Boston from Everett, Mass.....	22.50	23.00	22.00	23.50
Boston from Buffalo.....	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem.....	24.50	25.00	.....	.....
Canton, O., from Cleveland.....	22.39	22.39	21.89	22.89
Chicago from Birmingham.....	21.22	.....	.....	.....
Cincinnati from Hamilton, O.....	21.24	22.11	21.61	.....
Cincinnati from Birmingham.....	21.06	.....	20.06	.....
Cleveland from Birmingham.....	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.....	22.94	22.94	22.44	22.44
Milwaukee from Chicago.....	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago.....	.....	.....	.....	.....
Toledo or Detroit.....	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham.....	23.15	.....	.....	.....
Newark, N. J., from Bethlehem.....	23.53	24.03	.....	.....
Philadelphia from Birmingham.....	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.....	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island.....	.....	Neville base, plus 69c, 84c, and \$1.24 freight.	.....	.....
Saginaw, Mich., from Detroit.....	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malle- able
St. Louis, northern .....	21.50	21.50
St. Louis from Birmingham.....	†21.12	...
St. Paul from Duluth .....	23.63	23.63
†Over 0.70 phos.		

**Low Phos.**

Basing Points: Birdsboro and Steelton, Pa., and Philadelphia  
\$26.50, base; \$27.74 delivered Philadelphia

## Gray Forge

Valley furnace .....	\$20.50	Lake Superior f
Pitts. dist. fur. ....	20.50	do., del Chicp
		Lyles, Tenn. .

## †Silvery

Jackson county, O., base: 6-6.50 per cent \$25.50;  
7-7.50—\$26.50; 7.51-8—\$27.00; 8-8.50—\$27.50;  
9-9.50—\$28.50; Buffalo, \$1.25 higher.

## Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as  
plus \$1 a ton.

†The lower all-rail delivered price from Jackson is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon,  
\$1 per ton add. Each unit over 3%, add \$1 per ton.

## Refractories

Per 1000 f.o.b. Works, Net Prices

### Fire Clay Brick

Pa	Mo	Super Quality	
		Ky	\$60.80

First Quality

Pa., Ill., Md., Mo., Ky...	47.50
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na, Georgia.....  
ersey.....

New Jersey ..... 52.50  
Second Quality

.., Ky., Md., Mo..

Georgia, Alabama . . . . .	34.20
New Jersey . . . . .	49.00

Ohio

First quality	39.90
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mediate . . . . .  
quality

Second quality ..... 31.35

**Malleable Burn Brick**

alleable Bung B  
ses

**Silica Brick**

sylvania . . . . .

Joliet, E. Chicago.....	55.10
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Ladle Brick

Ladle Brick  
(Pa., O., W. Va., Mo.)

Press . . . . .

Wire cut ..... \$26.00

## Ferroalloy Prices

<b>Ferromanganese</b> , 78-82%, tidewater, duty pd... \$80.00	bon, per lb. contained chrome ..... 16.50c	carlots, contr., net ton \$142.50	contract, carlot
Do., del. Pittsburgh... 85.33	Do., ton lots ..... 17.25c	Do, spot ..... 145.00	¼-in., lb. ....
<b>Spiegeleisen</b> , 19-21% dom. Palmerston, Pa., spot... 28.00	Do., less-ton lots ..... 17.75c	Do, contract, ton lots 145.00	Do, 2% ..... Spot ¼c
Do., 26-28%, Palmerston ..... 33.00	Car- Ton loads lots Less ton	15-18% tl., 3-5% carbon, carlots, contr., net ton 157.50	<b>Silicon Briquets</b> , carloads freight allowed, ton ...
<b>Ferrosilicon</b> , 50% freight allowed, c.l. .... 69.50	2% carb... 16.50c 17.25c 17.50c	Do, spot ..... 160.00	Carload, spot ...
Do, ton lot ..... 80.50	1% carb... 17.50c 18.25c 18.50c	Do, contract, ton lots 160.00	Less-ton lots, lb.
Do., 75 per cent. .... 126.00	0.10% carb. 18.50c 19.25c 19.50c	Do, spot, ton lots. .... 165.00	<b>Manganese Briquets</b> , contract carlot bulk freight a lb. ....
Spot, \$5 a ton higher.	0.20% carb. 19.50c 20.25c 20.50c	<b>Alsifer</b> , contract carlots, f.o.b. Niagara Falls, lb. 7.50c	contract carlot bulk freight a lb. ....
<b>Silicomane</b> , 2% carbon.. 88.00	<b>Ferromolybdenum</b> , 55- 65% molyb. cont., f.o.b. mill, lb. .... 0.95	Do, ton lots ..... 8.00c	Ton lots ..... Less-ton lots
2% carbon, 93.00; 1%, Contract ton price \$11 higher; spot \$5 over contract.	<b>Calcium molybdate</b> , lb. molyb. cont., f.o.b. mill 0.80	Do, less-ton lots ..... 8.50c	Spot ¼c
<b>Ferrotungsten</b> , stand., lb. con. del. cars ..... 1.60-1.65	<b>Ferrotitanium</b> , 40-45% lb., con. tl., f.o.b. Niag- ara Falls, ton lots... \$1.23	<b>Chromium Briquets</b> , con- tract, any quantity, freight allowed, lb... 7.25c	<b>Zirconium Alloy</b> , contract, car gross ton ....
<b>Ferrovandium</b> , 35 to 40%, lb., cont.. 2.70-2.80-2.90	Do., less-ton lots ..... 1.25	Do, spot carlots, bulk 7.50c	Do, spot ..... 34-40%, contract
<b>Ferrophosphorus</b> , gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electro- lytic, per ton, c. l., 23- 26% f.o.b. Monsanto, Tenn., 24% \$3 unitage 75.00	20-25% carbon, 0.10 max., ton lots, lb.... 1.35	Do, ton lots ..... 8.00c	loads, lb., alloy Do, ton lots ...
<b>Ferrochrome</b> , 66-70 chromi- um, 4-6 carbon, cts. lb., contained cr., del. carlots ..... 10.50c	Do, less-ton lots ..... 1.40	Do, less-ton lots ..... 8.25c	Do, less-ton lots Spot ¼c lb.
Do, ton lots ..... 11.25c	Spot 5c higher	<b>Tungsten Metal Powder</b> , according to grade, spot shipment, 200-lb. drum lots, lb..... \$2.00	
Do., less-ton lots ..... 11.50c	<b>Ferrocolumbium</b> , 50-60% contract, lb. con. col., f.o.b. Niagara Falls... \$2.25	Do, smaller lots ..... 2.10	<b>Vanadium Pentoxide</b> , contract, lb. contained \$1.10
<b>Technical molybdenum</b> <b>trioxide</b> , 53 to 60% molyb- denum, lb. molyb. cont., f.o.b. mill... 0.80	Do, less-ton lots ..... 2.30	<b>Vanadium</b> ..... 1.15	Do, spot ..... 1.15
<b>Ferrochrom-titanium</b> , 15- 18%, tl., 6-8% carb.	Spot is 10c higher	<b>Chromium Metal</b> , 98% cr., 0.50 carbon max., contract, lb. con. .... 80.00c	<b>Molybdenum</b> P 99%, f.o.b. Yor 200-lb. kegs, lb. Do, 100-200 lb. Do, under 100-lb.
67-72% carloads, 2% car-		chrome ..... 85.00c	<b>Molybdenum</b> Briquets, 48-52% lybdenum, per contained, f.o.b. ducers' plant.
		Do, spot ..... 79.00c	
		Do, spot ..... 84.00c	
		<b>Silicon Metal</b> , 1% iron	



*Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials*

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# IRON AND STEEL SCRAP PRICES

*Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates broker's price.*

## HEAVY MELTING STEEL

Birmingham, No. 1.	†12.00
Bos. dock No. 1 exp.	13.75-14.00
New Eng. del. No. 1	14.00
Buffalo, N. 1	13.50-14.00
Buffalo, No. 2	11.50-12.00
Chicago, No. 1	12.50-13.00
Chicago, auto, no alloy	11.00-11.50
Chicago, No. 2 auto	10.00-10.50
Cincinnati, dealers..	10.75-11.25
Cleveland, No. 1	13.00-13.50
Cleveland, No. 2	12.00-12.50
Detroit, No. 1	9.50-10.00
Detroit, No. 2	8.50-9.00
Eastern Pa., No. 1	15.00-15.50
Eastern Pa., No. 2	12.50-13.00
Federal, Ill.	11.00-11.50
Granite City, R. R.	11.50-12.00
Granite City, No. 2	10.50-11.00
Los Angeles, No. 1	12.50-13.50
Los Angeles, No. 2	11.00-11.50
N. Y. dock No. 1 exp.	12.00-12.50
Pitts., No. 1 (R. R.)	16.00-16.50
Pittsburgh, No. 1	14.50-15.00
Pittsburgh, No. 2	13.50-14.00
St. Louis, R. R.	12.00-12.50
St. Louis, No. 2	10.50-11.00
San Francisco, No. 1	13.00-13.50
Seattle, No. 1	11.00-12.00
Toronto, dlrs. No. 1	9.75-10.25
Valleys, No. 1	14.00-14.50

## COMPRESSED SHEETS

Buffalo	12.00-12.50
Chicago, factory	11.75-12.25
Chicago, dealer	10.75-11.25
Cincinnati, dealers..	10.50-11.00
Cleveland	12.25-12.75
Detroit	10.50-11.00
E. Pa., new mat.	15.00-15.50
E. Pa., old mat.	11.00-11.50
Los Angeles	12.50-13.00
Pittsburgh	14.50-15.00
St. Louis	9.50-10.00
Valleys	13.50-14.00

## BUNDLED SHEETS

Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.50-11.00
Cleveland	9.50-10.00
Los Angeles	14.00
Pittsburgh	13.50-14.00
St. Louis	7.00-7.50
Toronto, dealers	8.25

## SHEET CLIPPINGS, LOOSE

Chicago	8.00-8.50
Cincinnati, dealers..	6.25-6.75
Detroit	7.50-8.00
†Los Angeles	3.75-4.00
St. Louis	6.00-6.50

## BUSHELING

Buffalo, No. 1	11.50-12.00
Chicago, No. 1	11.25-11.75
Cincin., No. 1, deal.	7.00-7.50
Cincinnati, No. 2	2.00-2.50
Cleveland, No. 2	7.50-8.00
Detroit, No. 1, new.	9.50-10.00
Valleys, new, No. 1	13.25-13.75
Toronto, dealers	4.25-4.75

## MACHINE TURNINGS (Long)

Birmingham	†4.50-5.00
Buffalo	6.50-7.00
Chicago	6.50-7.00
Cincinnati, dealers..	4.25-4.75
Cleveland	7.00-7.50

Detroit	4.50-5.00
Eastern Pa.	8.50-9.00
Los Angeles	4.50-5.00
New York	†3.50-4.00
Pittsburgh	8.50-9.00
St. Louis	3.50-4.00
Toronto, dealers	4.25-4.75
Valleys	8.50-9.00

## SHOVELING TURNINGS

Buffalo	7.50-8.00
Cleveland	7.50-8.00
Chicago	7.50-8.00
Detroit	5.75-6.25
Pitts., alloy-free	10.00-10.50

## BORINGS AND TURNINGS

*For Blast Furnace Use*

Boston district	2.00
Buffalo	7.25-7.50
Cincinnati, dealers..	3.00-3.50
Cleveland	7.50-8.00
Eastern Pa.	6.50-7.00
Detroit	4.75-5.25
New York	†2.50-3.00
Pittsburgh	8.25-8.75
Toronto, dealers	5.25-5.75

## AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	12.50-13.00
East. Pa., elec. fur.	13.00-13.50
St. Louis	9.00-9.50
Toronto	4.50-4.75

## CAST IRON BORINGS

Birmingham	†6.00-6.50
Boston dist. chem.	†4.50
Buffalo	7.00-7.50
Chicago	5.50-6.00
Cincinnati, dealers..	3.00-3.50
Cleveland	7.50-8.00
Detroit	5.00-5.50
E. Pa., chemical	10.00-11.00
New York	†3.50-4.00
St. Louis	2.50-3.00
Toronto, dealers	4.25-4.75

## RAILROAD SPECIALTIES

Chicago	14.50-15.00
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## ANGLE BARS—STEEL

Chicago	15.00-15.50
St. Louis	13.00-13.50

## SPRINGS

Buffalo	16.00-16.50
Chicago, coil	15.50-16.00
Chicago, leaf	14.50-15.00
Eastern Pa.	17.00-17.50
Pittsburgh	17.50-18.00
St. Louis	14.00-14.50

## STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.00-16.50
Cincinnati, dealers..	16.25-16.75
Detroit	16.00-16.50
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	18.00-18.50
St. Louis, 2 ft. & less	16.25-16.75

## STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	13.00-13.50
Cleveland	16.00-16.50

Pittsburgh	16.00-16.50
St. Louis	13.00-13.50
Seattle	16.00

## FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	13.00-13.50

## ARCH BARS, TRANSOMS

St. Louis	13.50-14.00
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## PIPE AND FLUES

Chicago, net	7.50-8.00
Cincinnati, dealers..	6.25-6.75

## RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	7.50-8.00
Cincinnati, dealers..	5.75-6.25
Eastern Pa.	12.50-13.00
New York	†8.50-9.00
St. Louis	8.00-8.50

## RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	16.00-16.50
St. Louis, No. 1	9.75-10.25
St. Louis, No. 2	11.50-12.00

## FORGE FLASHINGS

Boston district	†7.50-8.00
Buffalo	11.50-12.00
Cleveland	11.00-11.50
Detroit	9.00-9.50
Los Angeles	9.00
Pittsburgh	13.50-14.00

## FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

## LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops..	17.50-18.00
Eastern Pa., crops..	17.00-17.50
Pitts., billet, bloom, slab crops	18.50-19.00

## LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	15.50-16.00
Eastern Pa., crops..	17.50-18.00
Pittsburgh	17.00-17.50
Seattle	15.00

## RAILS FOR ROLLING

*5 feet and over*

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.00-17.50
New York	†14.00-14.50
Eastern Pa.	17.00-17.50
St. Louis	16.00-16.50

## STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†15.00
Chicago, net	17.50-18.00
Eastern Pa.	20.50-21.00
St. Louis	17.00-17.50

## LOCOMOTIVE TIRES

Chicago (cut)	15.00-15.50
St. Louis, No. 1	12.25-12.75

## SHAFTING

Boston district	†15.25-15.75
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New York	16.00-16.50
Eastern Pa.	13.00-13.50
St. Louis, 1	16.00

## CAR WHEELS

Birmingham	12.50-13.00
Boston dist.	13.00-13.50
Buffalo, steel	13.00-13.50
Chicago, iron	13.00-13.50
Chicago, roll	13.00-13.50
Cincin., iron	13.00-13.50
Eastern Pa.	13.00-13.50
Eastern Pa.,	13.00-13.50
Pittsburgh, n	13.00-13.50
Pittsburgh, st	13.00-13.50
St. Louis, iron	13.00-13.50
St. Louis, iron	13.00-13.50

## NO. 1 CAST S

Birmingham	12.50-13.00
Boston, No. 1	12.50-13.00
N. Eng. del.	12.50-13.00
N. Eng. del.	12.50-13.00
Buffalo, cuped	12.50-13.00
Buffalo, mach	12.50-13.00
Chicago, agri	12.50-13.00
Chicago, auto	12.50-13.00
Chicago, railro	12.50-13.00
Chicago, mach	12.50-13.00
Cincin., mach	12.50-13.00
Cleveland, ma	12.50-13.00
Eastern Pa., c	12.50-13.00
E. Pa., mixed	12.50-13.00
Los Angeles	12.50-13.00
Pittsburgh, car	12.50-13.00
San Francisco	12.50-13.00
Seattle	12.50-13.00
St. Louis, cuped	12.50-13.00
St. Louis, agr	12.50-13.00
St. L., No. 1 m	12.50-13.00
Toronto, No. 1	12.50-13.00
mach., net	12.50-13.00

## HEAVY CAST

Boston dist. h	12.50-13.00
New England	12.50-13.00
Buffalo, break	12.50-13.00
Cleveland, bree	12.50-13.00
Detroit, auto	12.50-13.00
Detroit, break	12.50-13.00
Eastern Pa.	12.50-13.00
Los Ang., auto	12.50-13.00
New York, br	12.50-13.00
Pittsburgh, br	12.50-13.00

## STOVE PLATE

Birmingham	12.50-13.00
Boston district	12.50-13.00
Buffalo	12.50-13.00
Chicago, net	12.50-13.00
Cincinnati, des	12.50-13.00
Detroit, net	12.50-13.00
Eastern Pa.	12.50-13.00
New York, fdy	12.50-13.00
St. Louis	12.50-13.00
Toronto dealers	12.50-13.00

## MALLEABLE

Birmingham, R	12.50-13.00
New England, d	12.50-13.00
Buffalo	12.50-13.00
Chicago, R. R.	12.50-13.00
Cincin., agri, d	12.50-13.00
Cleveland, rail	12.50-13.00
Eastern Pa., R	12.50-13.00
Los Angeles	12.50-13.00
Pittsburgh, rail	12.50-13.00
St. Louis, R. R.	12.50-13.00

## IRON ORE

<b>Lake Superior Ore</b>	
<i>Gross ton, 5 1/2%</i>	
<b>Lower Lake Ports</b>	
Old range bessemer	\$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

<b>Eastern Local Ore</b>	
<i>Cents, unit, del. E. Pa.</i>	
Foundry and basic	
56.63% con.	9.00-9.25
Cop.-free low phos.	
58-60%	nominal
<b>Foreign Ore</b>	
<i>Cents per unit, c.i.f. Atlantic</i>	
Foreign manganiferous ore, 45.55%	
iron, 6-10% man.	
nom.	12.00

No. Afr. low phos..	12.00
Swedish low phos..	12.00
Spanish No. Africa	
basic, 50 to 60%	
nom.	9.00-9.50
Tungsten. sh. ton.	
unit, duty pd. nom.	19.00-19.50
N. F., fdy., 55%	7.00
Chrome ore, 48%	
gross ton, c.i.f.	†\$23.00-24.00
Molybdenum ores	
sulphide, per lb.	

<b>Manganese</b>	
<i>Prices not included per unit</i>	
Caucasian, 50%	nom.
So. African, 50%	nom.
Indian, 49-50%	nom.



# ts, Strip

Strip Prices, Pages 80, 81

Sheet business is little if any pickup seen over April. However, buyers may be required for low stocks with

continue active on of corrugated galvan- inquiry for export to the likelihood of most being placed short- aid to be the deterring the principals are re- getting nearer together tion.

original inquiry, at as the 100,000 tons for is concerned, involved al- proposals, one calling for the curved and punched for these operations eadboard, it now appears ar proposal is the more followed.

Sheet and strip pro- continues to decline as a demand. Although lit- erative material is being sels are busy working out for new model steel. Output is about 50 per since last fall before holiday. Production by d cold strip mills is t 100 per cent or slightly less. sheet operations are

Resumption of auto- is awaited to turn sheet and strip demand efar little tonnage has e for 1940 models, but ders are expected be- of this month. Mean- s is receiving fair sup- miscellaneous consum- rly from jobbers and s of stoves, refrigera- household equipment. el prices are weak in s, sharp concessions be- offered on automotive ast week. at-rolled steel sales d further. Automotive e demand are e needs of household nterests are sustained. m farm equipment stably steady. Prospects automotive buying for e indefinite.

A local auto body as placed a few sample to try out 1940 model on current models is pleted. A surprising eplacement parts busi- ing through. Makers pings are active, the

radio trade being the best outlet. Virginia recently placed 250 tons of hot-rolled annealed pickled re- squared sheets at 3.61c, delivered Richmond. Elimination of the fractional allowance to jobbers on galvanized sheets still is not fully effective. It is also understood the 15-cent quantity extra on cold-rolled sheet orders of less than 75 tons is not generally applied.

**Boston** — Cold strip mill opera- tions are barely held at the April rate, about 50 per cent, by the flow

of new business, most of which is for prompt delivery and well diver- sified. There appears to be no buy- ing beyond immediate requirements, although inventories are low. Prices are steady.

**Buffalo**—Cautious buying is cur- tailing sheet and strip output. De- mand from heating equipment man- ufacturers is slightly heavier, but new business generally is in small lots for only immediate needs.

**Cincinnati**—Sheet and strip buy- ing is tending downward despite oc-

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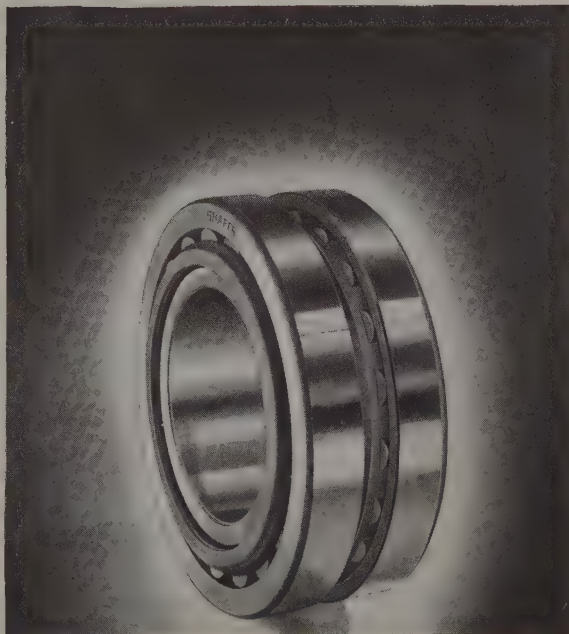
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**ROLLER BEARINGS**

casional gains. Quiet in automotive demand largely is responsible for the letdown, with jobbers and household equipment makers specifying steadily.

**St. Louis**—While April business was off from March, this trend was not universal for all producers. Galvanized sheets are more active, while light plates are in brisk demand from the oil industry.

**Birmingham, Ala.**—Sheets continue to lead in demand, on a relatively satisfactory basis, although somewhat below the capacity rate in evidence for the past few months.

Strip is being turned out at a somewhat accelerated pace in anticipation of the new cotton season.

## Plates

Plate Prices, Page 80

**New York** — Plate business is slow in the absence of sizable inquiries or orders. Closing on 300 gondolas by the Maine Central removes the last outstanding railroad item from the market, while

demand for repair material is being reduced by the growth of the coal ship under construction. May 152, with gross tonnage a slight decrease since but comparing with having gross tonnage a year ago, according to bureau of shipping.

**Cleveland** — Miscellaneous buying is quiet, but is bolstered by the plate tons for a water in Toledo. Little tonnage in ship or railroad repair work.

**Philadelphia** — Navy is distributing orders of plates, sheets and 20. Central Iron & Steel Co. and Wood Steel Co. and Co. were low on the Releases from private slow, but better act shortly. Miscellaneous fair, with some profit a slight gain. Export heavier but prices a low.

**Birmingham, Ala.**—Inquiries have shown a decline although Republic Steel has just installed equipment wider product. Current plates, however, are common.

**Seattle**—Largest plate market involves 1250 stocks for the Mud Mountain control project, Washington. Shops report only a run of work for boiler smokestacks.

**San Francisco**—Demand in large quantities is and little new business sight. So far this year have been placed, compared 578 tons for the correction in 1938.

**Washington** — Preliminary have been discussed for liners for American Pacific for trans-Pacific trade, 34,000 to 37,000 gross tons accommodations for more passengers. They will be the AMERICA, now being will cost about \$17,000.

### Plate Contracts

11,000 tons, 78-inch pipe, Toledo, O., to Bethlehem through Walter L. McCann, Indianapolis.

400 tons, four tanks, Steel Corp., Richmond, Va., to & Iron Co., Chicago.

100 tons, United States ship, boat, to Columbia Steel tons shapes to Bethlehem Lake Union Dry Dock Works, Seattle, general

### Plate Contracts

1250 tons, flood control



**INLAND  
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Floor Plate**

Safe floors save time in addition to preventing accidents. Inland's 4-Way safety tread provides dependable traction in all directions, for feet and wheels. No plant can be efficient with bad floors. Make yours right for years to come with Inland 4-Way Floor Plate.

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ash; bids to United States title, about July 1.  
tanks for Shell Union Oil d, Va., to Chicago Bridge Chicago.

from France; 11 tons of steel bands from Belgium. Also received were 59 tons of ferromanganese from the Netherlands and 29 tons of manganese ore from France.

appeared in oil country goods. Line pipe is slow. Mill quotations are unchanged, but some weakness in secondary markets for standard pipe continues, principally in the East.

**New York** — Scattered orders from gas utilities have bolstered a sagging market in steel pipe. This business is mostly for residential developments and includes no large line pipe tonnages. Commercial pipe demand declined markedly last month and the immediate outlook is not promising.

Bids on 15,000 tons of cement-lined cast pipe, 20-inch and under,

## Pipe

Pipe Prices, Page 81

**Pittsburgh**—Standard pipe inquiries are fair, with other lines dull. Mechanical and pressure tubing demand is light, and no increase has

Prices, Page 80

Occasional gains in demand insufficient to turn demand upward definitely needs are slow, new partsmakers. inquiries for 1940 auto involve only small sales are fairly numerous of the decrease in tonnage with previous in the small size of chassis.

Demand has leveled a recent decline, and movement is looked for of the month. Little in automotive buying before June, but retractor and farm implementers are well maintained the former.

Bar demand from shops has recovered lull, while brisk by airplane building specifications are accessory interests showing little interest. specifications are outlook is less promising from jobbers is ters of building hard to have passed the season.

Business continues tool makers have small lots. Demand and railroads current. Warehouse replacement is off sharply from early April but still is ar ago.

Ala.—New business considerably below some disappointment from producers of implements, and the downward.

demand is fairly automotive releases heavier demand elsewhere of miscellaneous unsatisfied. Railroad continues slow.

## Shapes Imported

Iron and steel importing the week ending surprised 239 tons of from Belgium and France; 65 tons of Belgium and 13 tons



... and

## Workers Who Sweat Need Salt

Doctors say: "Body salt must be restored when heat and sweat take it away."

Otherwise, Heat-Fag takes its toll—production sags and profits suffer.



## Replace Body Salt with

### MORTON'S SALT TABLETS

These little tablets represent the easiest and most convenient way to supply workers with the vitally needed salt that is sweated out by heavy work on hot days. In hundreds of the nation's leading plants, Morton's Salt Tablets are at every drinking fountain. A single push of the lever at the base of the modern sanitary Morton Dispenser supplies one tablet at a time.

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Write for folder —"Heat-Fag"



**MORTON SALT COMPANY**  
CHICAGO, ILLINOIS

# Behind the Scenes with STEEL

## National Pastime

■ This year, we learn from the latest Revere Copper & Brass employees' letter, is the rooth anniversary of baseball, the first game along modern lines having been played at Cooperstown, N. Y. back in 1839. The way our "pets", the Cleveland Indians, tossed away than ten-inning game to the Yankees last week we are inclined to believe they must have been members of the original outfit that started things back in the good old days. With the game tucked away in their laps, they pulled their usual trick of standing up.

## Slogan Contest

■ Here's a new game you may want to take a crack at. The object is to figure out what two nationally advertised products or companies are referred to in each of the following jumbled slogans. For instance, *The Pause In A Carload* is Coca Cola and Old Gold cigarettes as you can see. Okay, now go to work on these and if you get them all right we're willing to pay off with a clear two-bit Havana.

Ask The Man Who Knows Tobacco  
It's Time To Retire At Fifty  
Did You Say That Good Gasoline?  
Don't Write See The World  
Next To Myself Nobody's In Debt

## Tsk Tusk

■ Far be it from us to poke undue jibes at our own selves but we can't resist one little poke at the grin on the elephant's face in our new Materials Handling thumbprint on page 44. He looks to us like he's so ticklish he can hardly stand it.

## Still a Problem

■ Douglass Hawley of Minneapolis-Honeywell Regulator wants to know if we've noticed the resemblance of the nearly-completed Main Ave. bridge mentioned here last week to a cat getting ready to spring. Even

though Brother Hawley soothes us with sweet nothings about how he turns back here first thing each week and about how much he enjoys the rest of STEEL, we're afraid our imagination is stunted when it comes to bridges and cats. We stopped and stared for a full ten minutes the other night but the best we could make out of it was a slight resemblance to a little job we did on our erector set back in pre-school days.

## Temporarily Embarrassed

■ We've got a zipper that has gone haywire and no one yet around here seems able to fix it. Since it is a rather important one we're shooting it along to Fafnir's Elmer J. Butts who is pictured on page 48. If he can sharpen lawn mowers, fix radios, make furniture and bury the dead he has our complete confidence on a simple little thing like a zipper.

## Complacency

■ Heywood Broun once said that some people stop and buy an apple on the corner and then walk away as if they had solved the whole unemployment problem.

## An Idea At That

■ For a topnotch headline this week we'll take "Without Steel We'd Have To Give America Back To The Indians" in that Youngstown Sheet & Tube ad on page 45.

## STEEL Is Modern

■ Every week, we learn from managing editor A. J. Hain, STEEL could publish a second magazine from just the material that is eliminated and squeezed out in the job of making STEEL fit into your reading time. That is why STEEL needs 24 full time editors—that is why STEEL is the most easily-read and yet the most complete publication in the field today.

SHRDLU

are being considered city. United States Pipe Co. is low on most of Cast pipe demand other with some easiness in

**Birmingham, Ala.** are holding their own. Current business is not but there is a rather of small and scattered

**Seattle** Demand is important tonnages by district No. 20, Seattle May 6 for about 100 tons inch with alternates. awarded Crane Co. service boxes and hydrants and other ac

**San Francisco** So ment in demand for ca noted. The only large to American Cast Iron tons of 6-inch pipe for Calif. To date this year has been placed, compared 282 tons for the same ago.

## Cast Pipe Placed

161 tons, 6-inch class 15S Calif., to American Cast Birmingham, Ala.  
160 tons, 10 and 12-inch Wash.; to United States Pipe Co., Burlington, N. J.

## Cast Pipe Pending

3825 tons, 2 to 8-inch. project, Eugene, Oreg.;  
606 tons, 12 and 20-inch, Cale, Calif.; bids open  
426 tons, 4 and 6-inch, Beach, Calif.; bids open  
100 tons, or more, extension, town, Mont.; Pacific States Pipe Co., Provo, Utah.

## Wire

Wire Prices, Fair

**Pittsburgh** — Jobber merchant products are relatively stable prices ing out some buying previously. Demand in tricts continues active turers' wire continues d business from miscella is steady.

**Cleveland**—Wire den improved, with merchant relatively more active facturers' wire. Business is handicapped by erations of automotive ers, but with new mo tions expected to be in a few weeks some sm ment in business from is in prospect.

**Chicago** — Demand



of three weeks ago. needs are off considerably and has arisen from miscellaneous manufacturers. Manufacturers are using wire only among those lend-

incoming wire tonnage to-mouth basis with volume barely equaled. Department operations are present in most instances, excepted, with demand rather spotty. There is no advance buying, although stocks are light.

Buying is spotty and with operations of eastward steady at 50 per cent. refrains from buying needs. While business this spring has been the recent decline alleviated off.

**Ala.**—Wire products, second to sheets in demand have experienced some demand over the past production, while satisfaction up to what it was.

## Cars

Structural Prices, Page 81

eight car awards in 1935, exceeding by 33 per cent in entire first quarter placements were Missouri Pacific and Great Northern. Comments follows:

	1938	1937	1936
9	25	17,806	2,050
3	109	4,972	6,900
0	680	8,155	632
5	15	9,772	4,427
7	829	40,705	14,009
	6,014	4,732	8,900
	1,178	548	5,200
	0	1,030	7,229
	182	1,475	225
	1,750	1,216	1,750
	2,537	1,355	2,210
	1,232	275	1,550
	2,581	275	23,450
	16,303	51,611	64,523

orted well with award Central of 300 gondolas & Rio Grande subject to court approval, underframes. Union placed 10 cabooses and flat cars.

by the Atchison, Topeka & Santa Fe of thirty 1000-horsepower diesel passenger locomotives and one 4000-horsepower locomotive the largest in recent

## Locomotives Placed

Atchison, Topeka & Santa Fe, thirty 1000-horsepower diesel switchers and one 4000-horsepower diesel passenger locomotive; passenger and 13 switchers to Electro-Motive Corp., La Grange, Ill.; 12 switchers to American Locomotive Co., New York, and five to Baldwin Locomotive Works, Philadelphia. Kansas City Southern, two 2000-horsepower diesel-electric locomotives to Electro-Motive Corp., La Grange, Ill.

## Car Orders Placed

Denver & Rio Grande Western, 400 box cars, 100 automobile box cars, 50 gondolas and 100 underframes to Pressed Steel Car Co., McKees Rocks, Pa., subject to court approval. Maine Central, 150 forty-ton gondolas and 150 fifty-ton gondolas, to Bethlehem Steel Co., Bethlehem, Pa.; in addition to 300 box cars placed last month with Magor Car Corp., Passaic, N. J. Union Railway, 10 caboose cars, to Greenville Steel Car Co., Greenville, Pa. United States Navy, six flat cars, to Greenville Steel Car Co., Greenville, Pa.

## Car Orders Pending

Royal State Railways of Siam, electric cars and trailers, bids July 28; Messrs. Sanberg, 25 Broadway, New York, may be addressed for tender forms and information.

## Rail Orders Placed

Great Northern, 10,000 tons, allocation not announced.

## Buses Booked

American Car & Foundry Co., New York: Ten for North Boulevard Transportation Co., North Bergen, N. J.; five for Boston & Maine Transportation Co., Boston; five for Wyoming Valley Auto-bus Co., Wilkes-Barre, Pa.; two for Scranton Transit Co., Scranton, Pa.; one for Vermont Transit Co., Burlington, Vt.

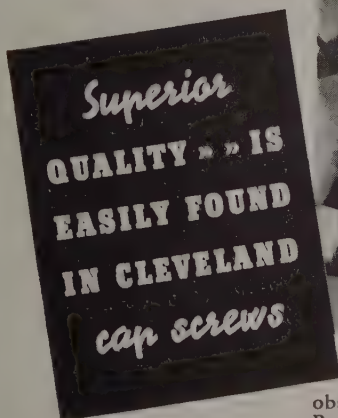
## Shapes

Structural Shape Prices, Page 80

**Pittsburgh**—Awards continue to hold strong, mostly government projects. Private work remains fairly numerous, however, and the outlook is fair.

**Cleveland**—Public work continues to dominate and no improvement in private projects is expected soon. Great Lakes Dredge & Dock Co., Chicago, is the general contractor on the Cuyahoga river straightening project, cut No. 6A, contract No. 7, requiring 1200 tons of piling. Bids

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go in May 11 on 1105 tons, sections 9 and 10, for the same project.

**Chicago**—Awards and inquiries are slightly lighter, but fluctuation is no more than normal. Total tonnage pending is substantially unchanged. Small orders are numerous but tonnages involved are minor, ranging between 10 and 50 tons in most instances.

**Boston** — Awards approximate 1000 tons, mostly small bridges, including 225 tons for a span at Lawrence, Mass., the remainder being mostly small I-beam structures in Vermont. Private inquiry is slack and public construction has also slipped materially, 1500 tons for a viaduct, Providence, R. I., being outstanding. Prices are weak.

**New York**—Inquiries and awards are gradually declining. Bridge requirements have notably lagged, although New York state is expected to resume inquiry for its usual program shortly. Fabricated prices continue easy and erratic.

**Philadelphia**—Bids went in last week on the Susquehanna river bridge, Havre de Grace, Md., requiring 14,500 tons. Several fabricators are entering bids May 15 for the Virginia-Ludlow Ferry bridge over Potomac river. Pennsylvania turnpike commission takes bids May 19 for the Tuscarora mountain and Ray's Hill mountain tunnels involving considerable tonnage. Several other public jobs are noted, but private work is lagging.

**Buffalo**—Activity continues to expand with many projects past the general contract stage. F. W. Hendrich Co., Inc., Buffalo, was low on the general contract for \$2,700,000 municipal auditorium, here, involving 3000 tons.

**Seattle** — Fabricators await with interest government plans for military defenses in Alaska, requiring heavy tonnages. New projects up for figures indicate a more active demand during the coming two months. Bids are expected out in June for 6000 tons involved in gates for the Coulee dam.

**San Francisco**—Inquiries continue

to appear slowly and business now aggregated. Outstanding inquiries amount to 1000 tons for towers for the East Calif., and 2500 tons for the mento river and the bridges for the Central Valley project, Calif. Awards totaled 174 tons, bringing the aggregate to 47,808 tons, compared with 47,808 tons last year.

**St. Louis**—While no new jobs have been noted, numerous jobs have materialized, including one at Greenville, Mo., for 10,000 tons and the other at N. Miss., involving 7500 tons, both bid May 16.

## Shape Contracts

- 2250 tons, apartment building, Way Corp., Philadelphia.
- Bridge Works, Pittsburgh.
- 800 tons, 122nd field artillery, Chicago, to Fort Pitt, Pittsburgh.
- 550 tons, new store, W. Buffalo, to Bethlehem Steel Co., A. L. Hartridge, New York, low on general contract.
- 440 tons, commercial building, Milliken Co., Leonard streets, New York, to A. Co., Pittsburgh.
- 370 tons, theater and storage, Hook district, Brooklyn, Gallis Iron Works, Birmingham.
- 365 tons, extensions to number 3, New York Ship, Camden, N. J., to Ross Philadelphia.
- 360 tons, Taylor avenue extension, to American Bridge, through Harrisburg, Washington.
- 350 tons, viaduct, Fairbairn state, to Fort Pitt, Pittsburgh.
- 275 tons, floating boom, Tennessee Valley special, to Ingalls Iron Works, Alabama.
- 270 tons, state bridges, Jamaica, Vt., to American Bridge, Pittsburgh.
- 265 tons, grade separation, Ill., to Bethlehem Steel, Pennsylvania.
- 260 tons, warehouse, M. Co., Austin, Ind., to Bridge & Structural Co.
- 250 tons, highway bridge, Colorado, to American Bridge, Pittsburgh.
- 240 tons, repairs, bridge, Central railroad, Toledo, to American Bridge Co., Pittsburgh.
- 220 tons, building, Federal Store Inc., Detroit, to J. Detroit.
- 205 tons, Union-Garden Lawrence, Mass., to Phoenixville, Pa.
- 200 tons, Grand Coulee Dam, Odair, Wash., for bureau, to Schnitt Steel Co.
- 200 tons, factory for Ryan Co., San Diego, Calif., to Works, San Diego, California.
- 190 tons, highway bridge, county, Colorado, to Iron Works, Denver.
- 180 tons, transmission line

## Shape Awards Compared

	Tons
Week ended May 6 .....	9,315
Week ended April 29 .....	20,638
Week ended April 22 .....	25,416
This week, 1938 .....	5,615
Weekly average, year, 1938 .....	21,566
Weekly average, 1939 .....	23,799
Weekly average, April .....	24,531
Total to date, 1938 .....	296,669
Total to date, 1939 .....	404,582
Includes awards of 100 tons or more.	



## —The Market Week—

California, to International Equipment Co.

nasium building, Fort Frances, Wyoming, for United States, to Pittsburgh-Des Moines Co., Pittsburgh.

Leavenworth store building, to American Bridge Co.,

oil derricks, Signal Oil & Signal Hill, Calif., to un-

SP-8-11 47-B(1) Grenada Mississippi, to Vincennes Vincennes, Ind.

driver tower, Pope's Creek, High Structural Steel Co., Pa.

nel liners, United States Los Angeles, to Commercial Stamping Co., Youngs-

s & Co. store, Fort Smith, Fort Smith Structural Steel Smith.

ge FAGH-288-A(1) Panola Mississippi, to Jones & Laugh-

3-foot plate girder span, lines, Texas, to Virginia Roanoke, Va.

### Contracts Pending

Greenville, Miss., bridge Mississippi river; bids May 16.

idge over Mississippi river, Miss.-Vidalia, La., for city bids May 16.

tes for Coulee dam; bids tion bureau, Denver, ex-

nicipal hall, Buffalo; F. W. Inc., Buffalo, low.

William Howard Taft high York; bids May 22.

ension to structural shop, United States navy.

ternate 135 tons, Ballard tie; bids in.

itter's shop, Portsmouth, yard; bids postponed to

g, Cuyahoga river straight-ct, cut No. 6A contract No. takes Dredge & Dock Co., neral contractor.

g, Cuyahoga river straight-ct, Cleveland, sections 9 May 11.

e bridge, Mazonia, Ill.

ver war library, for Le-ord university, Palo Alto,

ge, Bedford county, Penn-ver Juanita river; York Co., York, Pa., low.

air work, Goodyear Tire & Akron, O.; bids in.

ufacturing building, for o-Lite Co., Woodstock, Ill.

duct, Jackson street, St. for state.

ge, Albany street, Boston,

ol, Middletown, N. Y.; bids

ilding alterations, for 49 second Street Corp., New

o and laboratory building, ary of Bendix Aviation on, Md.

ne runway, Pickling plant, Philadelphia; bids May 10.

225 tons, state bridge, East St. Louis, Ill.  
210 tons, tunnel supports, specification 839, Central Valley project, Calif.; bids opened.

200 tons, fish hatchery, Leavenworth, Wash., specification 1218-D; bids opened.

700 tons, East side drive section, East Fifty-fourth to Sixty-fourth streets, Manhattan, N. Y.; bids May 19.

175 tons, extension to wharf, Iona Island, N. Y., for United States navy.

157 tons, also 113,000 feet sheet piling; bids for erection at Coulee diversion dam project, to reclamation bureau, Leavenworth, Wash., May 19; Spec. 843.

150 tons, state underpass, Casselton, N. Dak.

150 tons, South Side destructor plant, Minneapolis, for city.

150 tons, building, for University of Illinois, Urbana, Ill.

140 tons, building, Our Lady of Good Counsel church, Newark, N. J.

140 tons, state bridge, Mazonia, Ill.

125 tons, manufacturing plant, for Gelatin Products Co., Detroit.

125 tons, building, Forest Hills, N. Y., for New York Telephone Co.

125 tons, office and warehouse building, St. Louis, for United States government.

125 tons, apartment buildings, for River Forest Garden Apartment Corp., Chicago.

100 tons, bridge, Berks county, Pennsylvania; bids in.

Unstated, steel hatchery building, Coulee dam project; bids for erection to reclamation bureau, Leavenworth, Wash., May 22; Spec. 844.

Unstated, lift span for Columbia river bridge near Mount Hood, Ore.; Gilpin Construction Co., Portland, low.

Unstated, 48 overhead garage and shop doors for Fort Lewis, Wash. buildings; J. C. Wilson Corp., New York, low.

## Reinforcing

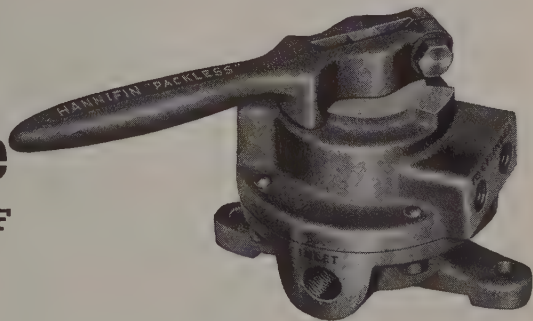
Reinforcing Bar Prices, Page 81

**Pittsburgh**—Demand is heartening in contrast to other steel markets and there appears to be no let-down in sight. Most sellers report engineering departments choked with specifications, and new tonnages each week still equalling placements. Awards are still coming largely from government-aided projects, although new factory additions and other private construction is noted.

**Cleveland**—Private work is dull. However, public inquiries are better. Bids are due June 2 on 750 tons for the Luna park housing project and Sam W. Emerson Co., Cleveland, has been awarded general contract for the Valley View housing project, here, 800 tons.

**Chicago**—Easing up in demand has been noted recently. Projects still are numerous, but average

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# HANNIFIN "Packless" VALVES

AIR CONTROL

tonnage involved is lighter. Tendency to hold back on closings is apparent. However, shipments have increased and now are well ahead of the comparable period a month ago.

**New York**—Small lot inquiry is heavier with more highway work coming out or pending for New York and New Jersey. Bridge needs are slack, however, and little improvement in prices is noted.

**Philadelphia** — Moderate amount of work remains before the trade, but volume of new projects is disappointing. Fabricating shops are fairly busy. Prices are none too steady.

**Seattle**—Prospects are improved with several sizeable tonnages to be placed within 60 days. Prices remain firm.

**San Francisco**—The reinforcing steel market was the most active the past week, with 2775 tons placed, bringing the aggregate to date to 68,793 tons compared with 35,879 tons in 1938. Columbia Steel Co. secured the largest award, 2000 tons, for the United States Engineer office, Los Angeles.

## Reinforcing Steel Awards

2218 tons, unit of Coulee dam, to Bethlehem Steel Co., Seattle.

2000 tons, United States engineer Office, proposal 210, Los Angeles, to Columbia Steel Co., San Francisco.

900 tons, barracks, Rantoul, Ill., to Joseph T. Ryerson & Son Inc., Chicago; Lipman Construction Co., contractor.

500 tons, viaduct, Joplin, Mo., to Sheffield Steel Corp., Kansas City, Mo.; through Concrete Products Co.

500 tons, substructure of bridge, S. Western avenue, Chicago, to Inland Steel Co., Chicago; through Joseph T. Ryerson & Son Inc., Chicago; Thomas McQueen Co., contractor.

500 tons, Panama Canal, schedule No. 3445, to Bethlehem Steel Co., Bethlehem, Pa.; through Virginia Steel Co.

425 tons, Rock Creek sewer, Washington, to Truscon Steel Co., Youngstown, O.; James Lombardi, Philadelphia, contractor.

325 tons, Taylor avenue overpass, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; through Harry R. Dickens, Washington.

200 tons, new store, W. T. Grant Co., Buffalo, to Bethlehem Steel Co., Buffalo.

300 tons, plant addition, Chicago Flexible Shaft Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

300 tons, waterworks, Kenosha, Wis., to Truscon Steel Co., Youngstown, O.

250 tons, grain elevator, Des Moines, Iowa, to Laclede Steel Co., St. Louis; James Stewart Co., contractor.

170 tons, viaduct, Ludlow avenue, Cincinnati, to Joseph T. Ryerson & Son Inc., Chicago; P. E. Hickey, Cincinnati, contractor.

168 tons, bridge in Las Animas county, Colorado, to unnamed interest.

160 tons, requisition 1006ER, Norfolk

navy yard, to Bethlehem Steel Co., Bethlehem, Pa.; Bethlehem Steel Co.

150 tons, store addition, Buffalo, to Bethlehem Steel Co., Buffalo.

150 tons, treasury department, 52,906, Los Angeles, interest.

144 tons, addition to hotel, Calif., to Bethlehem Steel Co., San Francisco.

140 tons, state highway, Yakima, Wash., post office, west Steel Rolling Mills, San Francisco.

100 tons, store for Philadelphia, Blisbee, Ala., interest.

100 tons, coffee plant, Los Angeles, to unnamed interest.

100 tons, sewage disposal, Va., to Jones & Laughlin, Pittsburgh; through Philadelphia, Inc., Philadelphia; Engle, Inc., contractors.

## Reinforcing Steel

2500 tons, Mud Mountain, Washington state; United States engineer, Seattle.

1835 tons, alternate 750 bridge approaches, Seattle.

850 tons, housing project, Cleveland; Sam W. Emery, land, general contractor.

750 tons, Luna Park, Cleveland; bids June.

750 tons, substructure, building, New York.

600 tons, U. S. Soldiers,ington; A. K. Wikstrom.

600 tons, outfall relief, field, Washington.

390 tons, municipal auditor, F. W. Hendrich Co., Inc.

375 tons, federal court, age, Alaska; McCarty, struction Co., St. Louis.

270 tons, filtration plant, Cumberland, R. I.

270 tons, fisheries canal, dam, bids to relocate, Leavenworth, Wash.

250 tons, superstructure, bridge, Pope's Creek, Md.

219 tons, industrial building, Island, San Francisco.

200 tons, additions, Cement Co., Allentown, Construction Co., Philadelphia, eral contractor.

130 tons, viaduct, superstreet, Cincinnati.

117 tons, grading, drainage

## Concrete Bars

Week ended May 6

Week ended April 29

Week ended April 22

This week, 1938

Weekly average, year

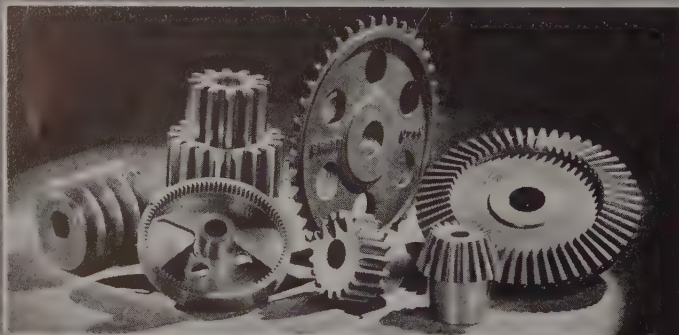
Weekly average, 1939

Weekly average, April

Total to date, 1938

Total to date, 1939

Includes awards of 100



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**GRANT GEAR WORKS — Boston**



nty, West Virginia; bids  
Soft Packing Co. warehouse,  
his in.  
blackwood connecting sewer,

## Iron

Iron Prices, Page 82

Pig iron deliveries  
slightly reduced pace  
with. Consumption varies  
different foundries. Produc-  
tion equipment are fairly  
some jobbing plants are  
productive, but indefinite na-  
tional outlook induces caution  
on iron beyond early needs.  
Movements the first  
May indicate shipments  
will be slightly below  
April. Foundry melt is  
waning gradually. Auto-  
demand has lessened and  
requirements are beginning

Soil pipe makers are  
using iron more freely, and  
manufacturers of light ma-  
chinery more active. In gen-  
eral, shipments and new  
ship little change. Ameri-  
cans are \$2 or \$3 too high  
of European inquiry received

New business is  
the melt shows little  
decrease. Cast pipe makers  
experienced a decided pickup  
and the general foundry  
is well occupied. Prices  
inquiries are unattractive.  
Charcoal iron also is be-

Shipments were slightly  
this week, partly the result  
of demand from manufac-  
turers, boilers and fur-  
naces. Most foundries  
are busy, with pig iron buy-  
ing. Plants working  
on orders are running  
fast. Blast furnace opera-  
tion curtailed to conserve

Except for foundries  
early in the month  
requirements, consum-  
ption increase in demand com-  
ing April. Machine tools and  
equipment give best pros-  
pect for demand in the near

Shipments have de-  
creased since early April,  
and expect some improve-  
ment by June. Consumption is  
slowly, being aided by in-  
crease in activity at stove plants.

Ala.—Except for  
four blast furnaces,

there has been little reduction in  
activity in that division here. De-  
mand is satisfactory and shipments  
are holding up well. Eleven stacks  
are active.

**Toronto, Ont.**—Sales are steady at  
about 1200 tons weekly. Both spot  
and forward buying are in small  
lots, larger melters being protected  
on current needs by yard stocks.  
Opening of navigation on the Great  
Lakes is expected to stimulate ship-  
ments and sales.

## Scrap

Scrap Prices, Page 84

**Cleveland**—Scrap continues dull.  
Reductions of about 50 cents in most  
grades except cast has not stimu-  
lated buying. New York Central  
scrap is said to have moved east  
for export, for most part, at the  
same prices as a month ago.

**Pittsburgh**—Demand is dull, but  
available quantities of scrap are  
not sufficient to depress the market  
further and prices are unchanged.

Information here indicates scrap  
from the Baltimore & Ohio list re-  
cently closed went for export at  
about \$16. Specialties were strong

and it is believed part of this ton-  
nage will come into this district.  
Pennsylvania railroad closings are  
expected to follow the same pattern  
although there is a possibility some  
of the steel may go into domestic  
consumption.

**Chicago** — Quotations are firm,  
although a softening had been ex-  
pected. Covering of recent \$13  
sales of No. 1 heavy melting steel  
generally is being done at \$12.75.  
Scrap is moving freely, both to con-  
sumers and from the country.

**Boston** — Scrap buying is light,  
mostly for export orders, dock de-  
livery prices for heavy melting  
steel and other grades being un-  
changed. The domestic market is  
sluggish, although the Worcester  
consumer has been taking in some  
heavy melting steel from nearby  
dealers. The trend in domestic  
prices is slightly easier, including  
chemical borings, skeleton and  
forge fire scrap.

**New York**—Domestic buying of  
steelworks and foundry grades con-  
tinues light. Prices generally are  
unchanged but are not tested. Ship-  
ments to eastern mills are princi-  
pally against old orders. Most ac-  
tivity continues for export and most-  
ly against old commitments, al-

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shows welding arc  
as seen through a  
No. 12 CONVEN-  
TIONAL LENS.  
Note glare and  
lack of visibility.  
Photo at right  
shows welding arc  
as seen through a  
No. 12 AGILE  
MIRROR LENS.  
Note visibility and  
lack of glare.



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protective media for the eyes as science can produce. The mirror  
reflects back much of the glare, permitting the use of a lighter shade  
of dark glass—and a lighter shade of dark glass, of course, gives  
better visibility. An AGILE MIRROR LENS is built for welders, with  
the supposition that a good product sells itself. Let us tell you more  
about its remarkable properties.

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CLEVELAND, OHIO

though Japan last week placed a small routine monthly tonnage.

**Philadelphia** — The market finds support in export demand which is continuing bids of \$13.50 and \$15 for No. 2 and No. 1 steel, respectively. Foreign shipments this month may reach 30,000 tons. Meanwhile district steelmakers are well covered and consumers of miscellaneous grades also show little interest in making new commitments. Some prices are lower. E. G. Budd Mfg. Co. has placed 3000 tons of new compressed sheets at slightly above \$14, plant. This compares with the April accumulation of 3400 tons.

**Buffalo** — Small lots are being sold, with No. 1 steel holding at \$13.50 to \$14. About 10,000 tons has been taken from the area between Syracuse and Albany for export. A district consumer now has taken about 14,000 tons, mostly No. 2 bundles. Recent boat receipts of turnings and borings total 12,000 tons.

**Detroit** — Scrap prices continue to decline. Most grades are off another 50 cents, with mixed boring and turnings down \$1. No buying support has appeared. Automotive scrap lists last week were uniformly lower than a month ago.

**Cincinnati** — Scrap appears weaker, although quotations are nominally unchanged. Covering of old contracts is being done without difficulty despite only small offerings from dealers. A test of prices awaits bidding on railroad lists.

**St. Louis** — Scrap trading continues virtually at a standstill, although one large inquiry for heavy melting steel is pending from an interest

which has not bought for several months. Offerings from all sources continue light.

**Toronto, Ont.** — Offerings are increasing steadily, and shipments to yards are heavier than to consumers. Most scrap reaching dealers is sheet steel and automotive material, with some boiler plate. Most demand is from smaller users but a few larger consumers are understood to be planning to take in heavier tonnages. Prices are unchanged.

## Warehouse

Warehouse Prices, Page 83

**Cleveland** — Business the past week showed the hesitation common to early days of a month. Sellers look for a moderate recovery soon, although May is expected to show little if any improvement over total April volume.

**Chicago** — Sales have picked up from the slower pace prevailing the first few days of May. It is thought the month's business will equal that of April.

**Pittsburgh** — Demand is light and prices are weak, particularly in construction materials. Bar quotations also are easy. A few warehouses are refusing to meet low prices.

**Cincinnati** — Orders show little change since a month ago. Inquiries for building work involve small lots.

**Buffalo** — While April sales showed a slight increase, warehouses are not encouraged by the outlook. Structural shape demand is slow to

expand. Prices of several grades are weak.

**St. Louis** — April sales were fewer than in the two preceding months. Building products are in demand, while orders in iron, quarry, coal and oil are fairly heavy.

**Philadelphia** — Business is better but still ahead of last year. However, the month is only slightly better than April, probably due to seasonal gains in galvanized and wire demand. Prices are improved.

**Seattle** — While the price shows an average drop of about a ton from last month, the market has been stabilized at these levels. This situation after a seasonal buying have a volume of sales and industry.

## Steel in Europe

Foreign Steel Prices, Page 83

**London** — (By Radio) Demand continues to record production is on several lines. Commerce is active in the plenish stocks. Deliveries are extended, owing to government demands. Steel and sheet mills are working. Steel requirements are supplemented by increased imports and supplies from Australia. Iron continues quiet.

The Continent reports active in most markets, with orders for Great Britain firmer.

## Tin Plate

Tin Plate Prices, Page 83

Tin plate specification is operating, and May and June production is expected to be 10 per cent. Operations lately have 5 points to 70 per cent. improvement in the seasonal, it is better anticipated 30 to 60 days ago.


One unfavorable factor is the large carryover of tin plate packs in most sections of the country. Otherwise, stockpiles are reasonably low.

Demand for general tinplate manufacturing and miscellaneous uses is sustained, while business is fairly steady.

## Bolts, Nuts, Rivets

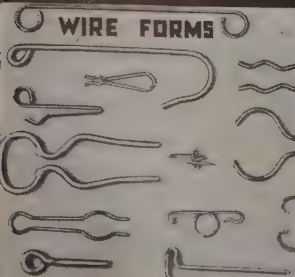
Bolt, Nut, Rivet Prices, Page 83

Scattered gains in demand have been below expectations.




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requirements have tapered while railroad needs have in some instances by of shops affected by mining suspension. Con- farm equipment build- active. Additional bolt, net business from ship- prospect though not Prices are fairly

tons daily following the recent heavy coverage. Electrolytic held unchanged at 10.25c, Connecticut, in the producers' market, at around 10.10c in the outside market for re-sale, and between 10.00c and 10.20c in the export market.

**Tin** — Continued active demand

here, accompanying a rise in tin plate operations, lifted Straits spot prices to new highs since 1937. Standards advanced to within £5 of the £230 level which is the price at which the buffer pool supposedly will begin to liquidate their hold- ings. Straits spot closed at 49.25c.

## Nonferrous Metal Prices

*Spot unless otherwise specified. Cents per pound.*

	Electro, del. Conn.	Copper Lake, del. Midwest	Casting, refinery	Straits Tin, New York Spot Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Alumi- num 99%	Anti- mony Amer. Spot, N.Y.	Nickel Cath- odes
April	29 10.25	10.25	9.87 ½	49.25 48.62 ½	4.75	4.60	4.50	20.00	11.50	35.00
May	1 10.25	10.25	9.75	49.25 48.55	4.75	4.60	4.50	20.00	11.50	35.00
	2 10.25	10.25	9.75	49.12 ½ 48.40	4.75	4.60	4.50	20.00	11.50	35.00
	3 10.25	10.25	9.75	49.25 48.50	4.75	4.60	4.50	20.00	11.50	35.00
	4 10.25	10.25	9.75	49.20 48.50	4.75	4.60	4.50	20.00	11.50	35.00
	5 10.25	10.25	9.75	49.25 48.50	4.75	4.60	4.50	20.00	11.50	35.00

### MILL PRODUCTS

*F.o.b. mill base, cents per lb, except as specified. Copper brass products based on 10.25c Conn. copper*

Sheets	
Yellow brass (high)	16.65
Copper, hot rolled	18.37
Lead, cut to jobbers	8.00
Zinc, 100 lb. base	9.75

Tubes	
High yellow brass	19.40
Seamless copper	18.87

Rods	
High yellow brass	12.00
Copper, hot rolled	14.87

Anodes	
Copper, untrimmed	15.62

Wire	
Yellow brass (high)	16.90

### OLD METALS

*Nom. Del. Buying Prices*

No. 1 Composition Red Brass	
New York	5.87 ½ - 6.12 ½
Cleveland	6.50 - 6.75
Chicago	6.12 ½ - 6.37 ½
St. Louis	6.00 - 6.25

Heavy Copper and Wire	
New York, No. 1	7.87 ½ - 8.00
Cleveland, No. 1	7.75 - 8.00

Chicago, No. 1	7.50 - 7.75
St. Louis	7.50 - 7.75

### Composition Brass Borings

New York	5.12 ½ - 5.37 ½
----------	-----------------

Light Copper	
New York	6.37 ½ - 6.62 ½
Cleveland	6.00 - 6.25
Chicago	6.12 ½ - 6.37 ½
St. Louis	6.00 - 6.25

Light Brass	
Cleveland	3.25 - 3.50
Chicago	3.87 ½ - 4.12 ½
St. Louis	3.50 - 3.75

Lead	
New York	4.10 - 4.35
Cleveland	3.50 - 3.75
Chicago	3.50 - 3.75
St. Louis	3.50 - 3.75

Zinc	
New York	2.50 - 2.62 ½
Cleveland	2.00 - 2.25
St. Louis	2.00 - 2.25

Aluminum	
Borings, Cleveland	5.75 - 6.00
Mixed, cast, Cleveland	7.25 - 7.50
Clips, soft, Cleveland	15.25 - 15.50
Misc. cast, St. Louis	7.00 - 7.25

### SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	10.50
Standard No. 12 aluminum	12.50 - 13.00

## Ore

Prices, Page 84

Prices on Lake Su- for delivery during navigation season have unchanged from figures. These are: Old for bessemer and \$5.10 per; Mesabi range, bessemer and \$4.95 for Prices are per gross at lower lake ports. ore carriers are head- now that the passage prior is finally open. at of the season was the last week. Small ship- on ore in April from ports, 56,798 tons against last year, reflect the by the weather in of navigation. Lake on Ore association fig- st month's movement

	April	April
	1939	1938
	29,758	22,361
	12,503	
		10,176
	14,537	218,594
		9,383
	56,798	260,514

## Metals

— Inquiries by Great the United States navy and lake copper, to- 2050 tons, failed to stimulate on the part of other last week. Activity in metals was centered in copper and occasionally prices held steady. demand continued heavy sellers having little in balancing each day's in comparatively low levels in any price move holding at 4.60c, East

buying 5382 tons of the week ended April continued to buy at the recent average rate. kept prime western above the 4.50-cent East Domestic sales dropped age rate of under 1500

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## Equipment

**Cleveland**—Easiness in machine tool and equipment orders in the first week of May is interpreted by some machine tool dealers as only a temporary recession. Week's business was reported below the April weekly average, a good month for most suppliers. Aircraft part-makers are most active currently and at least three such firms have expansion programs underway. Machine tool men already are looking forward to a sharp increase in automotive business.

**Chicago**—Machinery orders have decreased, sellers state. Until April 10 sales had been good. It is now estimated sales for April as a whole showed a moderate loss compared with any of the three previous months. Nevertheless, inquiries are down only slightly and selling interests are hopeful that business will be improved during the first week of May. Few heavy machinery purchases have been made lately, considerable holding-back being evident in this line.

**Seattle**—Seasonal volume is about normal, road maintenance and electrical items, probably in best demand. Bonneville authority, Portland, has called bids May 9 for furnishing distributing transformers for six substations. Pacific Electric Mfg. Co., San Francisco, is low to same office for furnishing nine potential devices for Ampere station and Westinghouse is low for

switches and equipment at five substations. Harnischfeger Corp., has sold power shovels to Whatcom county, Wash., and Oregon highway commission. Yakima, Wash. has

placed orders for \$175,000 of road equipment. Pugmire yard has opened proper circuit breakers, and equipment.

## Construction and Enter

### New York

**CLARENCE CENTER, N. Y.**—National Gypsum Co., Buffalo, is receiving bids in construction of a 50 x 60-foot plant addition, costing \$40,000. Engineer, care of owner. (Noted April 3.)

**ENDICOTT, N. Y.**—City, board of trustees, is completing surveys for construction of projected extensions to municipal electric distributing lines at cost of \$500,000.

**NEWARK, N. Y.**—City, L. H. Wright, superintendent of public works, has authorized survey for a municipal power plant costing more than \$150,000.

**NIAGARA FALLS, N. Y.**—Carborundum Co., Syracuse, N. Y., soon will let contract for erecting a one-story, 60 x 112-foot addition to its plant.

**ROCHESTER, N. Y.**—Rochester Gas & Electric Corp. is taking first bids in projected construction of a maintenance building costing \$150,000. Gordon & Kaelber, Rochester, engineers.

**ROTTERDAM, N. Y.**—M. F. Hulett is taking bids on construction of a plant for manufacturing patented alloy castings and accessory materials.

**SILVER CREEK, N. Y.**—City has revised plans for constructing a filtration plant costing \$119,748. PWA project. Will soon mature. Hill & Hill, North East, Pa., consulting engineers.

**TROY, N. Y.**—Automotive Tool Sales Co. Inc. has been incorporated with capital of \$10,000 to manufacture automotive tools and accessory equipment.

S. J. Leombruno, Glenn representative.

### Connecticut

**PUTNAM, CONN.**—Bids for this month by L. F. Caproni for a two-story, 85 x 400-foot manufacturing plant costing \$100,000. Construction is to be in brick and steel.

### Massachusetts

**SPRINGFIELD, MASS.**—Phillips, superintendent, is making bids until May 18 on construction of main sewer plant. Gascoigne & Associates, New York, consulting engineer.

### Pennsylvania

**ERIE, PA.**—City, Harry Oakes, director, has completed specifications for construction of a sewage system costing \$100,000.

**PITTSBURGH** — Allison Co., O. Falk, president, has awarded contract for a \$100,000 estimated to cost approximately \$100,000 to Siesel Construction Co., building, Pittsburgh. (Noted April 3.)

### Ohio

**COLUMBIANA, O.**—Village Oakes, clerk, is making plans for construction of a new water and sewer system involving sump pump and other equipment. May mature soon.

**HUBBARD, O.**—City, J. H. Hubbard, mayor, is taking bids due May 15, on revised plans for construction of a waterworks costing about \$100,000. The project involves water softening plant, 100,000-gallon capacity, centrifugal pumps, mains, filters, chemical plant. Consulting engineer, E. J. Akron, O. (Noted April 3.)

**NORTH BALTIMORE, O.**—Fred Halboth, mayor, is taking bids for construction of a municipal water and light system costing \$100,000. The project includes two 450-horsepower pumps and one 375-horsepower pump. Consulting engineer, C. J. Wert, O.

**OAK HARBOR, O.**—Village Oakes, clerk, is making plans for construction of a water and sewer system costing \$13,500 for improvement of the system. Champs, Finkbeiner & Co., Toledo, O., consulting engineer.

**PORTSMOUTH, O.**—City, J. H. Han, city manager, will make bids for projected construction of a water treatment plant costing \$260,000. The project will have 8,000,000-gallon capacity. Consulting engineer, Charles Stevens, O.

**RIPLEY, O.**—Village Oakes, clerk, is making plans for construction of a water and sewerage disposal plant costing \$233,000. Grunkmeyer & Associates, Cincinnati, consultants.

**SANDUSKY, O.**—City, R. J. Sandusky, engineer, is making plans for construction of a water and sewerage disposal plant costing \$100,000.



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## —Construction and Enterprise—

city manager, is planning to install new diesel engines to generate power for pumping station and street lighting current. Report on cost now being submitted. City engineer, E. E. Hartung.

SHARONVILLE, O.—Village, Harry McGrew, mayor, is considering construction of a new municipal light and power plant. Consulting engineer, C. O. Simon, Van Wert, O.

### Michigan

ADRIAN, MICH.—City, Fannie N. Collins, clerk, asks bids until May 12 on contract 3, involving improvements and additions to Imhoff tanks and sewage pumping station. Part of \$120,000 PWA sewage project. Shoecraft, Drury & McNamee, Ann Arbor, Mich., consulting engineers.

### Illinois

CHICAGO—Reliance Steel Corp., Cleveland, proposes to build a steel plant here estimated to cost approximately \$100,000.

JOLIET, ILL.—Joyce 7-Up Inc. is asking bids for a one and two-story bottling plant costing \$200,000. Graham, Anderson, Probst & White, Chicago, architects.

### District of Columbia

WASHINGTON—Navy department, bureau of supplies and accounts, takes bids to May 9 for a gasoline engine-driven, rotating-boom crane (schedule 6092); and until 10 a. m., May 12, on three engine lathes (schedule 6188); and a universal metal bandsaw (schedule 6215); May 16, motor generator and controller (schedule 6169); all types of saws and miter boxes (schedule 6180); and two precision milling machines (schedule 6240); May 19, six electric chain hoists (schedule 6219); and a tube bending machine (schedule 6202); May 23, portable electric grinders (schedule 6236); May 26, motor driven pumps and spare parts (schedule 6263.)

### Florida

JACKSONVILLE, FLA.—City commission, Guy L. Simmons, chairman, receives bids May 1 for constructing improvements to waterworks plant, including pressure pumps, booster pumps, reservoirs, pipe, valves, gauges, chlorinators and meters. W. Austin Smith, Jacksonville, consulting engineer.

MARIANNA, FLA.—Star Naval Stores, A. J. McMullin, representative, is making plans for rebuilding its naval stores plant which was recently destroyed by fire.

### Georgia

BRUNSWICK, GA.—Georgia Power Co., care of purchasing agent, Atlanta, Ga., is receiving bids on construction of a 54 x 61-foot warehouse building.

DECATUR, GA.—City has plans for a complete water supply system estimated to cost approximately \$2,000,000. Roberts & Co., Decatur, consultants.

LAGRANGE, GA.—Seminole Bottling Co., S. J. Prescott, general manager, proposes to construct a bottling plant costing \$40,000. Will quadruple present capacity.

PINE LAKE, GA.—City, C. W. Childs, mayor, plans to construct a water system, involving deep well and storage

facilities. Will probably vote on bond issue.

### Mississippi

BATESVILLE, MISS.—Tallahatchie Valley Electric Power association, P. O. Box 156, is receiving bids for a rural electric power distribution system 149 miles long. Thomas H. Allen, Memphis, Tenn., consulting engineer.

### Louisiana

NATCHITOCHES, LA.—Southern Cotton Oil Co., Canal Bank building, New Orleans, will soon call for bids in construction of a 100-ton capacity oil mill on a 10-acre site. Buildings are to be brick, concrete and steel.

### Virginia

HARRISONBURG, VA.—Shenandoah Valley Electric co-operative, L. E. Long, superintendent, plans to erect 95 miles of rural electric lines in five counties at cost of \$100,000.

### Missouri

JEFFERSON CITY, MO.—State building commission, Edgar Eagan, executive secretary, will complete plans about May 30 and then take bids for construction at auxiliary prison of a diesel engine generating plant costing \$50,000. Baumes Engineering Co., St. Louis, consulting engineer.

### Oklahoma

CUSHING, OKLA.—City has voted to issue bonds for installing at cost of \$31,500 a 400-horsepower diesel engine generator set and switchboard in the municipal light and power plant. W. L. Austin, Cushing, engineer.

STILLWATER, OKLA.—Lincoln County Electric co-operative plans to install 65 miles of rural electric power lines at cost of \$60,000 in three counties. Midwest Engineering Co., Tulsa, Okla., consultant.

### Minnesota

BAGLEY, MINN.—Village, George Courney, recorder, takes bids to 1 p. m., May 12, on construction of sewers, sewage treatment plant and lift station. Certified check 15 per cent to accompany bids. Druar & Milinowski, St. Paul, consulting engineers.

JORDAN, MINN.—Minnesota Valley Electric co-operative, O. W. Mueller, secretary, is preparing plans for constructing 250 miles of rural power transmission lines. Consultant, Banister Engineering Co., St. Paul.

PRESTON, MINN.—Fillmore County Co-operative Electric association, Carl Kjos, manager, is completing plans for construction of two units of rural electric transmission lines, totaling 346 miles, and will soon take bids. Banister Engineering Co., St. Paul, consulting engineer.

### Texas

COST, TEX.—Guadalupe Valley Electric Co-operative Inc. has \$166,000 REA allotment for construction of 198 miles rural electric power lines in four counties. V. L. Beavers, Victoria, Tex., consulting engineer.

HOUSTON, TEX.—Pittsburgh Plate Glass Co. is completing plans for expanding its plant here. Has acquired 19-acre site and will erect three fireproof buildings costing \$150,000. Later will build complete glass manufacturing plant.

WELLINGTON, TEX.—Electric Co-operative association, president, plans 136 miles of rural power lines in two counties at William G. Morrison, Dallas, engineer.

WESLACO, TEX.—Atlantic City, Philadelphia, proposes in Weslaco field a gas casinghead gasoline plant at cost \$1,000,000.

### North Dakota

FARGO, N. DAK.—Vet. Administration, Washington, is until 1:30 p. m., May 23, and related equipment for administration building here per cent with bid.

### Nebraska

HEBRON, NEBR.—RE. \$182,000 loan to the Rural Public Power district president, to finance costs miles of rural transmission

MINDEN, NEBR.—City, tin, clerk, takes bids to 8, on installation of poles consisting of service switches and instruments

### Iowa

LAKE MILLS, IOWA—C. bak, mayor, is considering of a complete water filtration

MUSCATINE, IOWA—C. light board, R. E. Reuling, taking bids to 7:30 p. m., tions 3 and 4 in power plants 7500-kilowatt turbogenerators face condenser. Certified cent to accompany bid. Ye Muscatine, consulting eng

WATERLOO, IOWA—Mathews, clerk, is completing repairing its light system about \$22,000. Charles T. engineer.

### Colorado

DENVER—Bureau of re bids until May 18 for three pumping units for installation plant No. 1 at Glia production 842.

### Pacific Coast

EL CENTRO, CALIF.—4th tion district is taking bids on a diesel plant extension and power substation structure in all over \$40,000. M. J. D. Calif., consulting engineer.

TOPPENISH, WASH.—W tion district, Don M. Carr, \$200,000 federal allocation to complete No. 2 unit of ish creek pumping plant.

### Canada

SHINING TREE, ONT.—Mines Ltd., F. C. Van Norn Toronto, will soon receive constructing a gold ore mill in about \$75,000.

ABITIBI, QUE.—Claverton Ltd. takes bids in June to treat 50 tons of ore daily. engineer, care of owner.

ESTEVAN, SASK.—Consultative Refineries Ltd., E. E. eral manager, Kronau, Saskatchewan, build a briquet plant costing





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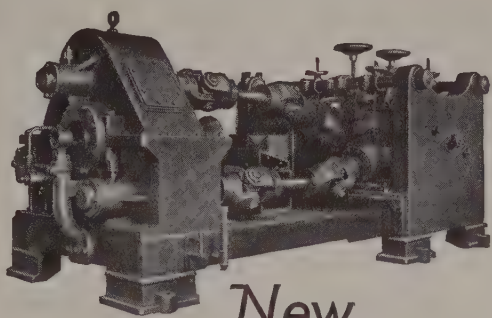
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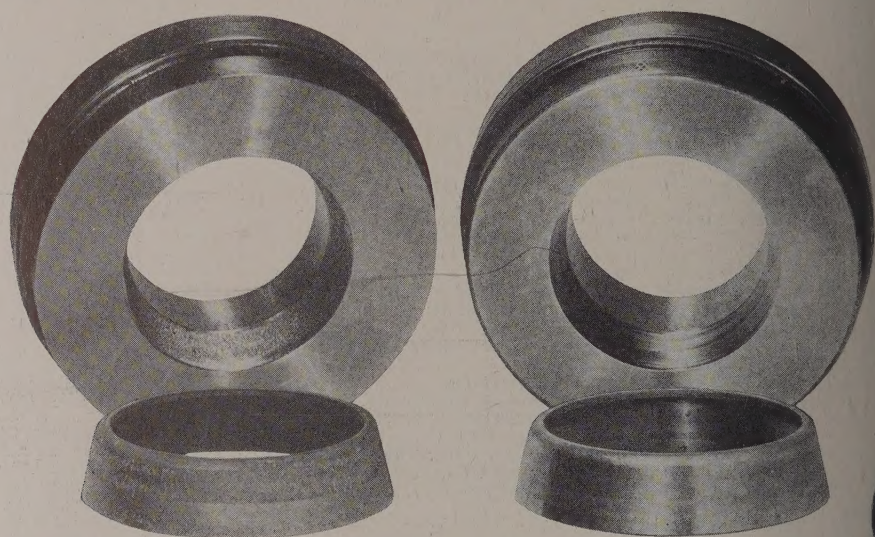
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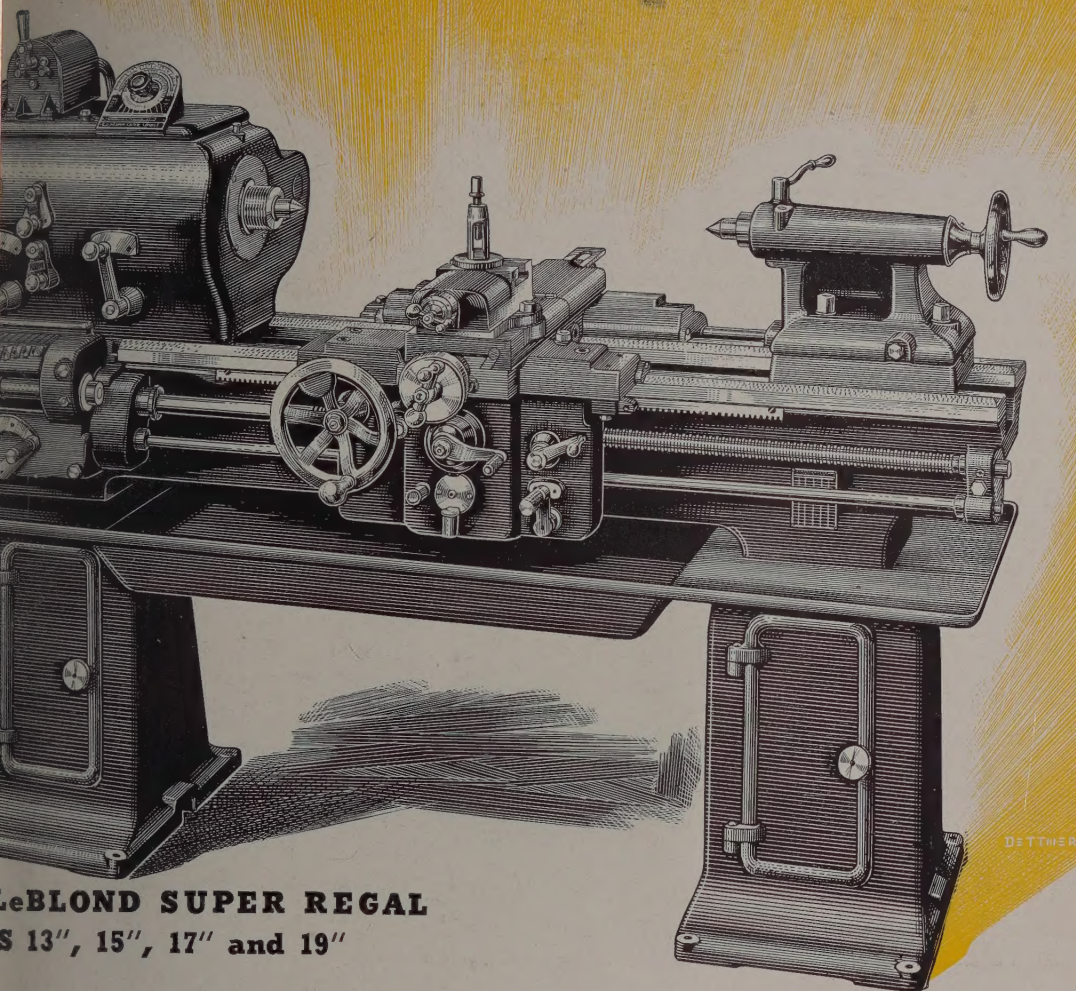
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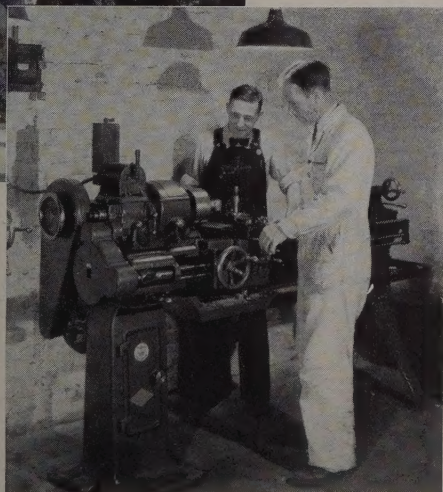


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n the maintenance  
l structure.



New—redesigned—vastly improved—heavier construction throughout—increased swing—sturdier bed with exceptionally heavy ways. Furnished with either plain or anti-friction bearings . . . Speed selector now built into headstock with dial to show cutting speed for commonly machined materials—to indicate R. P. M. for proper cutting speed—to show lever settings to deliver indicated speed . . . These new features plus Regal's well known safety, accuracy, simplicity and performance, will be welcome news to Regal enthusiasts.

*For  
detailed  
data on the  
new Super  
Regals  
Address  
Dept. J-3*





# Complete Control by EC&M



All three 25-Ton Morgan Soaking Pit Cranes serving this mill are completely EC&M Controlled.

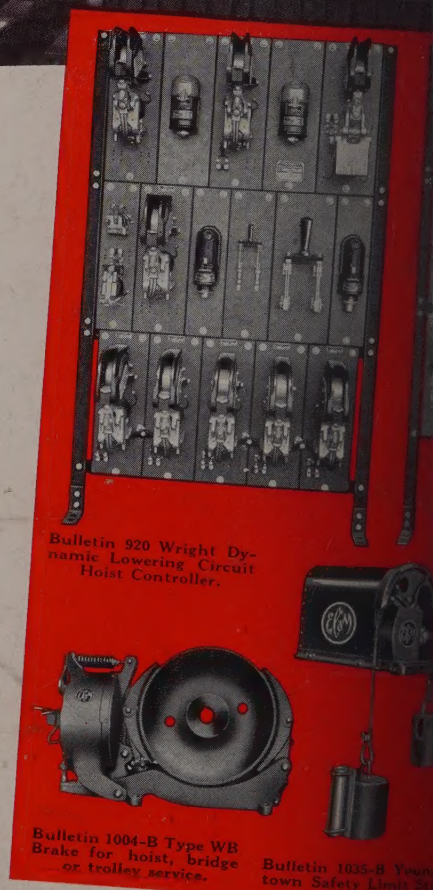
**M**ANY crane users recognize that EC&M, specializing in Crane Control Apparatus for many years, has perfected every unit of control for this important industrial service.

● **Type WB Brakes**, for example, have thick, tough, moulded brake blocks for long life, infrequent adjustment; they're easy to maintain and armature removal is rapid since there are no rods or levers over the brake wheel. ● **Magnetic Controllers** use Line-Arc Contactors, a major development increasing contact life and eliminating destructive burning on arc shields.

● **Time-Current Acceleration** promotes speedy handling—as fast as the motor is able to accelerate the load and on the Hoist Motion, the **Wright Dynamic Lowering Circuit** permits accurate inching combined with "More Trips per Minute with Less Power Consumption" ● As a positive

check against Human Error, the EC&M **Youngstown Safety Limit Stop** removes the fear of an overhoisting accident from the operator's mind, enabling him to do better work.

● Specify this economical, efficient apparatus for your next crane.



Bulletin 920 Wright Dynamic Lowering Circuit Hoist Controller.

Bulletin 1004-B Type WB Brake for hoist, bridge or trolley service.

Bulletin 1035-B Youngstown Safety Limit Stop

*When buying Cranes, Specify* **EC&M**